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Solid State Ionics

SSI

21st International Conference

June 18-23 2017

PADUA - ITALY

PROGRAM GUIDE

WELCOME AND PREFACE

It is a great pleasure for the Organizing Committee of the 21st International Conference on Solid State Ionics (SSI-21) to welcome to Padua all the people involved in research and technology development within the realm of solid-state ion-conducting materials for energy conversion and storage, communication, robotics, and biological applications.

Padua, the host city for SSI-21, is one of the most significant cities in the tradition of classical and humanistic culture, and the birthplace of one of the oldest universities in the world (established in 1222). Indeed the scientific revolutionary Galileo Galilei lived and taught here for eighteen years (1592-1610). Around the year 1600, Padua became the first place where inductive experimental methods flourished and, during the following centuries, promoted all fields of science leading ultimately toward modern technology and lifestyle.

This year SSI comprises more than 1400 contributions, involving participants from all parts of the world. The topics of SSI-21 will cover fundamental and applied aspects of ion-conducting materials, including experimental and theoretical studies of their properties as well as mechanisms of charge migration and interactions. An understanding of the fundamentals of solid state ionic materials is central to their applications in batteries, fuel cells, redox flow batteries, capacitors, supercapacitors, sensors, actuators and photo-electrochemical devices, not to mention the fields of microelectronics and biotechnology. Particular emphasis will be given to cutting-edge topics of high fundamental and practical interest, including secondary batteries beyond the lithium ion, anion-exchange membrane fuel cells, redox flow batteries and new microelectronic devices.

In this manner, SSI-21 is bringing together leading international scientists, engineers, top-level industrial management and business executives to discuss all areas of Solid-State Ionics in a highly multidisciplinary environment.

The thirty SSI-21 Symposia, covering both the fundamental and the applied aspects of Solid-State Ionics, are grouped into the following four Macro-Areas:

Macro-Area 1, Ionics in Energy and Environment: 17 symposia focused on the research of solid-state ionic materials (*e.g.*, SEs - solid electrolytes; MIECs - mixed-ionic electronic conductors and electrodes) for energy conversion and storage systems, and their performance in the corresponding devices, such as fuel cells and electrolysers, redox flow batteries, primary and secondary batteries, supercapacitors, photovoltaic devices, apparatii for thermochemical energy storage and water/CO_2 splitting.

Macro-Area 2, Ionics in Communication and Robotics: 4 symposia covering different aspects of ionic science and technology aimed at the development of advanced materials and systems for application in the ICT (information and communication technology) field, including memristors, switches, conductors, and microelectronic components. This macro-area also covers the applications of ionics science and technology in robotics (*e.g.*, for the development of actuators and other related devices).

Macro-Area 3, Ionics in Biological systems and Life sciences: 2 symposia exploring the impact of ionics in biological systems, covering areas such as ion transport through membranes, the detection and transduction of stimuli, and the interfaces between biological and artificial systems. This also includes the mimicking of biological operations by electrical circuits including MIECs.

Macro-Area 4, General Aspects, Fundamentals and Theory in ion-conducting materials: 7 symposia emphasizing the fundamental contributions of several research areas: *"Cross-effect"* phenomena; Mesoscale phenomena; High-field effects. Also included is the implementation of advanced characterization techniques and Computational modeling and simulations.

SSI-21 is organized by faculty from the University of Padua and the Massachusetts Institute of Technology, under the patronage of the Italian Ministry of Economic Development. Sponsorship comes by way of the International Society for Solid State Ionics (ISSI), The International Society of Electrochemistry (ISE), The International Association for Hydrogen Energy (IAHE), The Electrochemical Society (ECS), the Electrochemical Division of the Italian Chemical Society, the National Interuniversity Consortium of Materials Science and Technology (INSTM), the Army Research Office, the United States Army International Technology Centre, the Office of Naval Research – Global, and *"Fondazione Cassa di Risparmio di Padova e Rovigo"*. We would like to thank these organizations for their cooperation. Financial support, provided by the institutions and companies listed elsewhere is also highly appreciated. Special thanks are paid to the members of the Organizing committee, Scientific Advisory Board, Symposium Organizers, and to the Local Committee for their crucial and valuable contribution to the organization of SSI-21 events. In addition, we wish to express our most sincere thanks to all the participants who, with their innovative research, are contributing toward extending this dynamic field of science and technology.

Lastly, an extended version of selected papers will be published in the prestigious Solid-State Ionics special issue after regular reviewing procedures are followed.

We wish all participants and accompanying persons a profitable and memorable time in Padua.

Padua, June 2017

Prof. Vito Di Noto

Conference Chairman
Section of Chemistry for Technology in the Department of Industrial Engineering, University of Padua (Padua, Italy)

Prof. Harry L. Tuller

Conference Co-Chair
Department of Materials Science and Engineering, Massachusetts Institute of Technology (Cambridge, MA, USA)

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Fax +39 049 860 2389
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URL: www.meetandwork.it

MEETING SYMPOSIA

BATTERIES

I-1 – Beyond lithium batteries: ionic transport in post-Li systems
I-2 – Advanced Lithium and Sodium Battery Electrode Materials
I-3 – All Solid-State Batteries
I-4 – Ionics in "open" batteries (redox flow batteries)

POLYMER ELECTROLYTES

I-5 – Polymer electrolyte ionomers: advances in cation- and anion-exchange membranes and ion-conduction
I-6 – High-temperature proton-conducting polymer membranes
I-7 – "Polymer Electrolytes" - The ubiquity of ions and polymer materials in devices
III-2 – Materials to modulate Ionic Transport in Biological Systems

OXIDE BASED ELECTROLYTES

I-8 – Ceramic Proton and Hydride Ion-Conductors
I-9 – Solid oxide fuel cells and electrolyzers

NANOMATERIALS AND INTERFACES

I-10 – Multi-functional oxide nanomaterials: from design to advanced applications
I-11 – Functional metal oxide interfaces in efficient electrochemical energy conversion, biomass conversion and charge storage systems
I-12 – Defect chemistry, transport and reactivity at gas/electrode interfaces
I-14 – Electrocatalysis at the electrode-solid electrolyte interface
IV-3 – Interfacial processes and nanoionics

SOLAR CELLS AND PHOTODRIVEN ENERGY CONVERSION AND STORAGE

I-15 – Photochemical and photocatalytic energy conversion
I-16 – Solar thermochemical cycles based on redox-active oxygen-conducting metal oxides
I-17 – Mesoscopic Solar Cells

2D/LOW DIMENSIONAL MATERIALS

II-1 – Low-dimensional ionic and mixed ionic/electronic conductor nanostructures
II-3 – The science and technology of 2D materials

ADVANCED CHARACTERIZATION METHODS

IV-2 – Advances in high spatial resolution probing of local heterogeneities in ion-conducting materials
IV-4 – Point defect chemistry of oxide materials
IV-5 – Transport in Morphologically Heterogeneous Porous Media: Advancing Characterization from In-Situ to In-Operando
IV-6 – Synchrotron and Neutron techniques for the study of ion-conducting materials
IV-7 – Nuclear Magnetic Resonance in Solid State Ionics

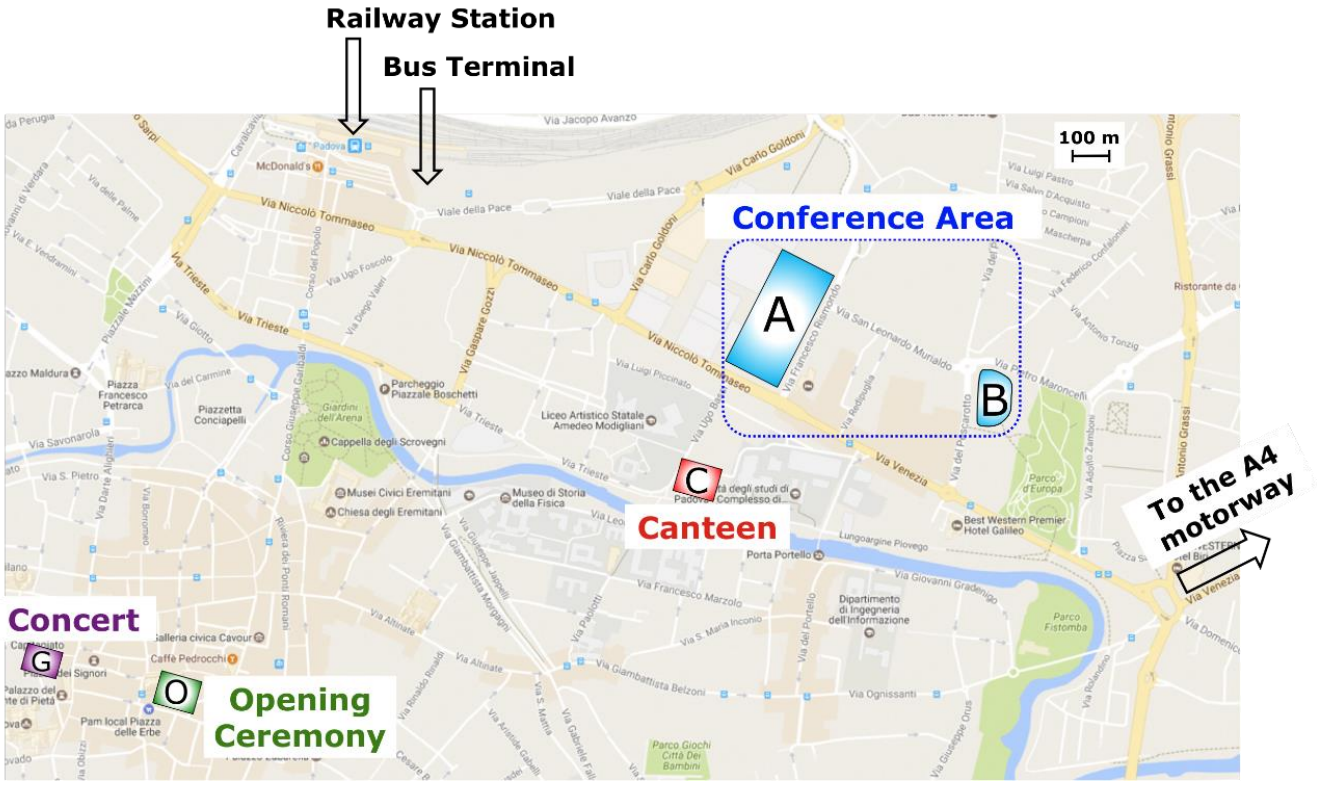
OTHER TOPICS – THEORY, MODELING, APPLICATIONS

I-13 – Electro-chemo-mechanical coupling in energy storage and conversion materials
II-2 – Realization of new functional optoelectronic oxide based materials: experiment and theory
II-4 – Ionics of Memristor/Resistive Switches
III-1 – Ionics meets bioscience
IV-1 – Modelling and simulation of ion-conducting materials

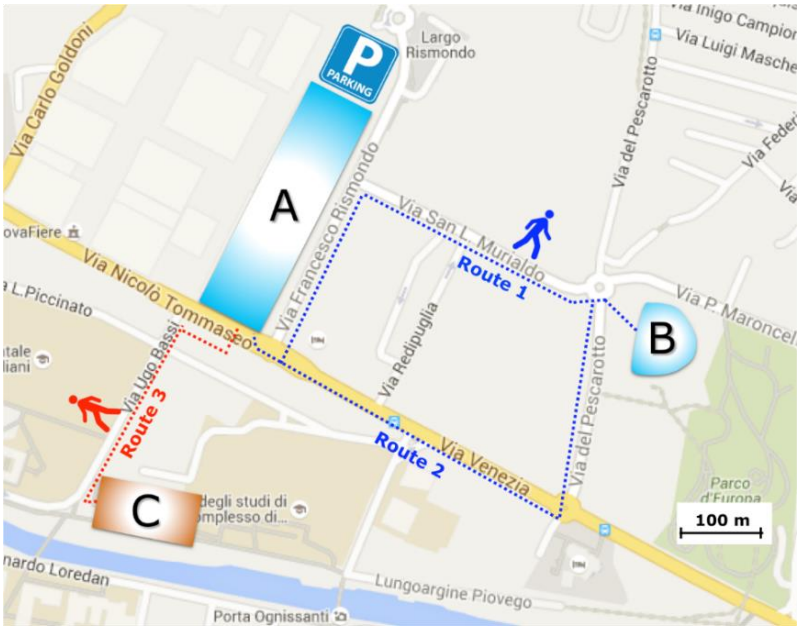
CONFERENCE VENUES

The activities of the **21st International Conference of Solid-State Ionics** are carried out in two locations in the northeastern part of Padua (**A** and **B** in the map below), a short walk from city centre and close to the major public transportation hubs. The **Opening Ceremony** of **SSI-21** will be held in ***"Palazzo della Ragione"*** (**O** in the map below). Lunches will be served in the canteen ***"Mensa Nord Piovego"*** (**C** in the map below). The Concert that will be held on Tuesday June 20th, will be hosted in ***"Sala dei Giganti"*** (**G** in the map below).

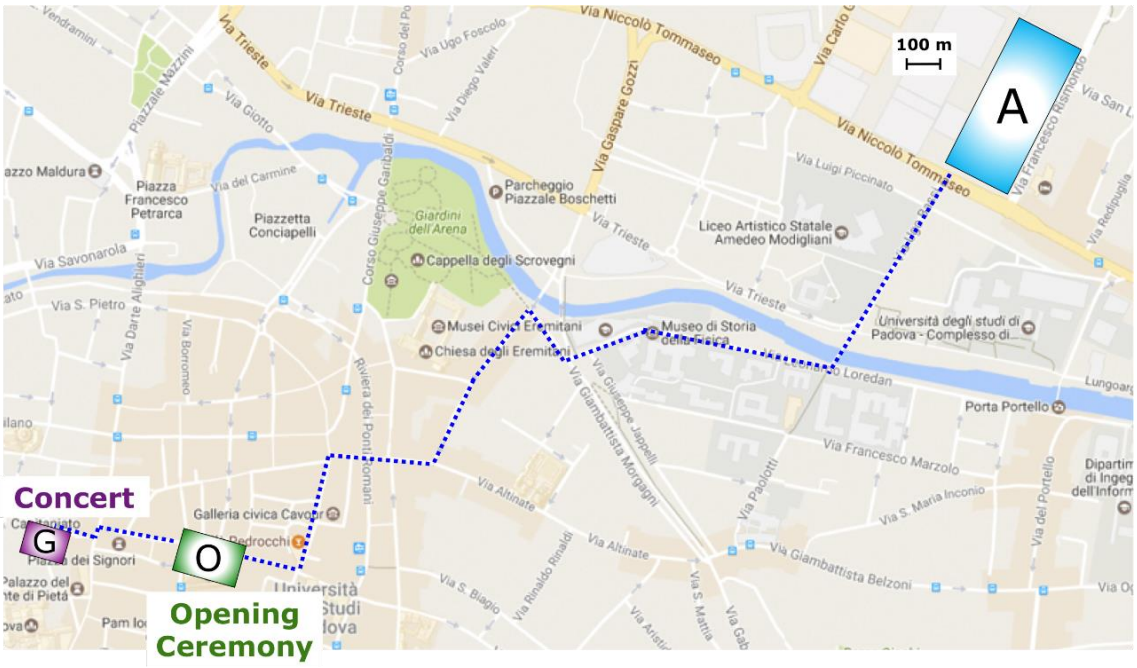
KEY
A → Hall 7 of ***"Padova Fiere"*** (Via Niccolò Tommaseo, 59, 35131 Padova)
B → Campus ***"Fiore di Botta"*** (Via del Pescarotto, 8, 35131 Padova)
O → ***"Palazzo della Ragione"*** (Piazza delle Erbe, 35100 Padova)
C → ***"Mensa Nord Piovego"*** (Viale Giuseppe Colombo, 1, 35131 Padova)
G → ***"Sala dei Giganti"*** (Palazzo Liviano, Piazza Capitaniato, 7, 35139 Padova)



CONFERENCE AREA

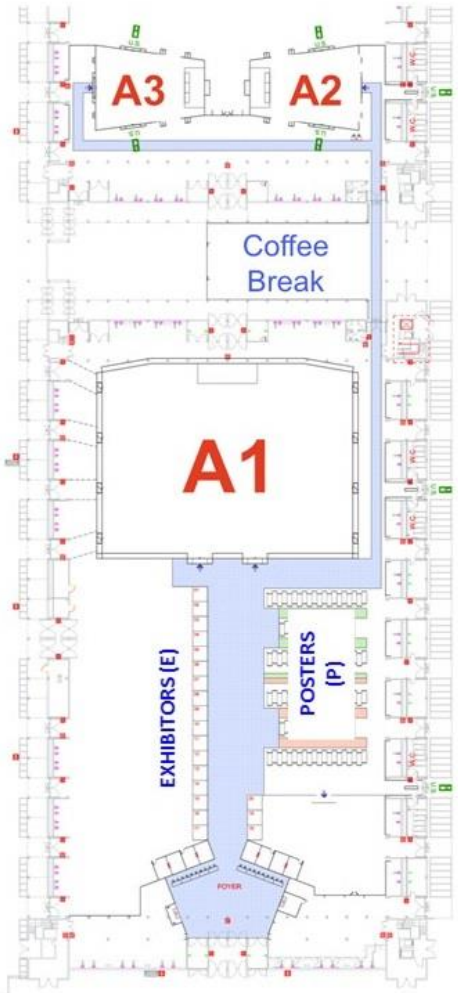


ROUTE FROM CONFERENCE AREA TO CITY CENTER



A: HALL 7 OF *"PADOVA FIERE"*

GROUND FLOOR



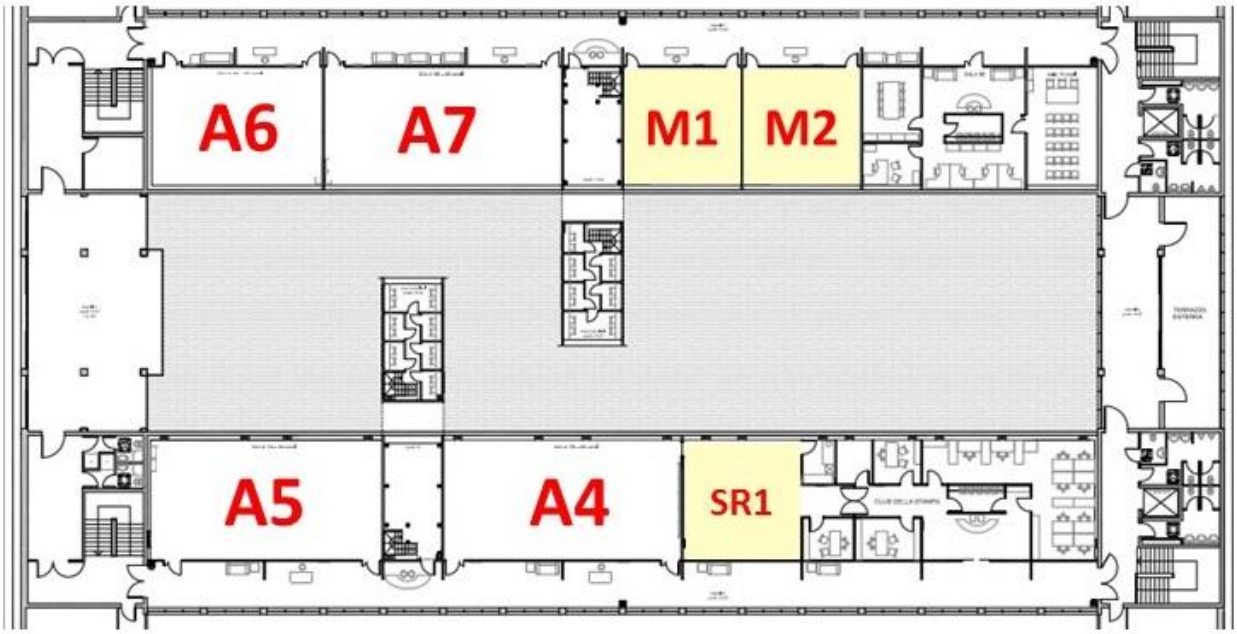
Gross exhibition area: 10.000 m²
Height: 12 m
Clear ceiling height: 11 m

Key
A1 = Plenary room;
A2 – A3 = Presentation Rooms for parallel sessions;
P = Posters area;
E = Exhibition area.

A: HALL 7 OF *"PADOVA FIERE"*

FIRST FLOOR

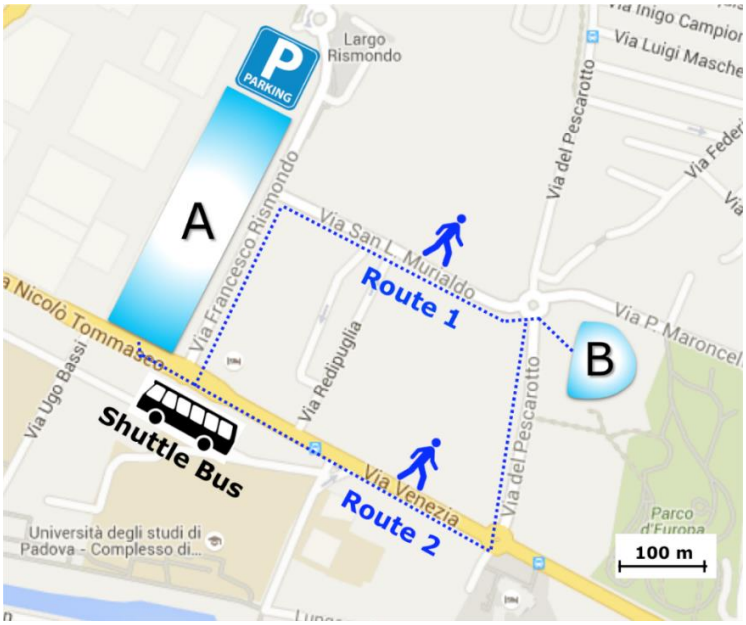
Gross exhibition area: 700 m^2
Clear ceiling height: 4 m



Key
A4 – A7 = Presentation Rooms for parallel sessions;
M1, M2 = Meeting Rooms;
SR1 = Speaker's Room.

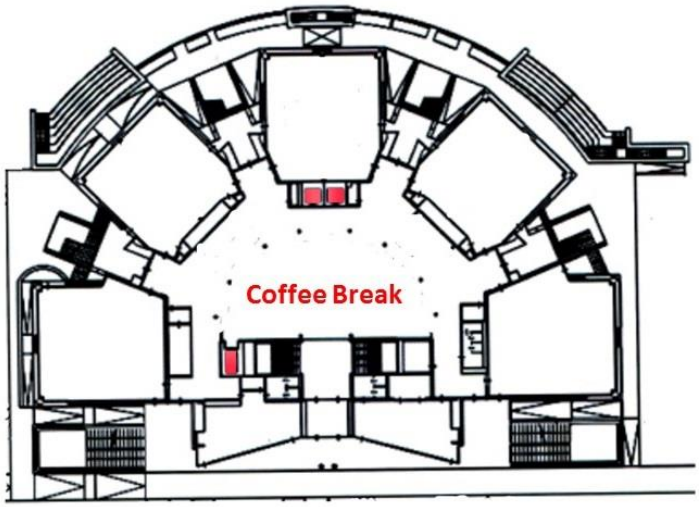
CONNECTIONS FROM A TO B:

- By walk: there are two main routes that connect Hall 7 of *"Padova Fiere"* (A) and Campus *"Fiore di Botta"* (B):
  - ***Route 1:*** Via San L. Murialdo - takes *ca.* 5 minutes by foot and is the most direct path;
  - ***Route 2:*** Via Venezia / Via del Pescarotto - takes *ca.* 7 minutes by foot. This is the recommended route.
- By shuttle: two shuttle buses will also be available to move SSI-21 participants between sites A and B.

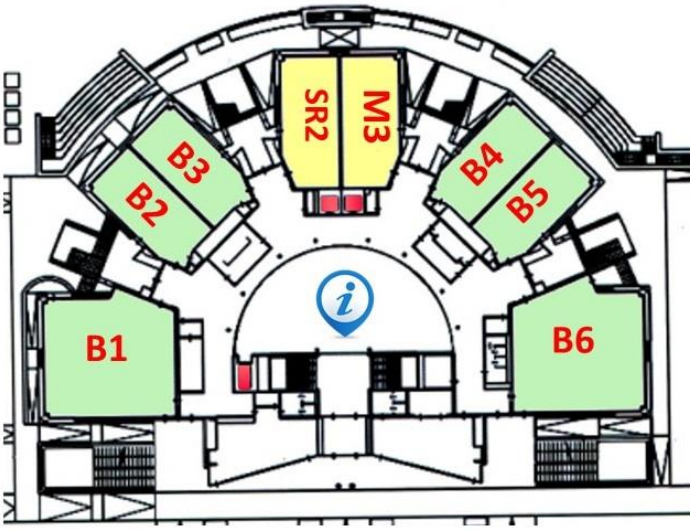


B: CAMPUS "FIORE DI BOTTA"

BASEMENT



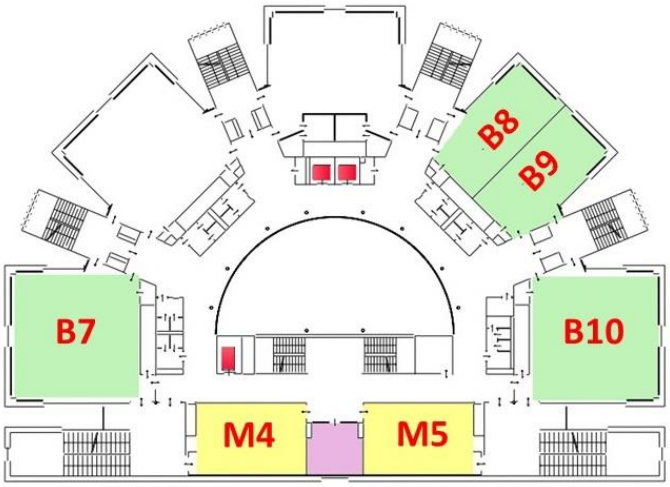
GROUND FLOOR



B: Campus *"Fiore di Botta"*

Key
B1 – B6 = Presentation Rooms for parallel sessions;
M3 = Meeting Room;
SR2 = Speaker's Room;
i = Information Desk.

FIRST FLOOR



Key
B7 – B10 = Presentation Rooms for parallel sessions;
M4, M5 = Meeting Rooms.

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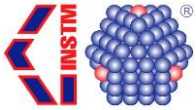

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GENERAL DAILY SCHEDULE

SATURDAY 17th JUNE

REGISTRATION **14:00-18:00**
"Padova Fiere" (A)

SUNDAY 18th JUNE

REGISTRATION **7:30-17:00**
"Padova Fiere" (A)

POSTER SET-UP **7:30-17:00**
"Padova Fiere" (A)

PARALLEL SESSION (I-3) **9:40-10:40**
Room: A3

COFFEE BREAK **10:40-11:00**

PARALLEL SESSIONS (I-2, I-3, I-9) **11:00-12:45**
Rooms: A4, A3, A2

LUNCH 12:20-14:20

PARALLEL SESSIONS (I-2, I-3, I-9) **14:20-16:05**
Rooms: A4, A2, A3

COFFEE BREAK **15:20-16:25**

PARALLEL SESSIONS (I-2, I-3, I-9) **16:15-18:00**
Rooms: A4, A2, A3

OPENING CEREMONY & WELCOME PARTY **19:00-22:00**
"Palazzo della Ragione" (O)

TUTORIAL I **8:00-11:15**
"Impedance Spectroscopy in Solid State Ionics, from basics to applications"
Room: A5

TUTORIAL II **11:15-13:05**
"Nuclear Magnetic Resonance in Solid State Ionics"
Room: A5

TUTORIAL III **13:35-15:25**
"Nanoionics – Fundamentals and Applications"
Room: A5

TUTORIAL IV **15:25-18:10**
"Neutron scattering techniques in the study of solid-state ion-conducting materials"
Room: A5

MONDAY 19th JUNE

REGISTRATION **7:30-17:00**
"Padova Fiere" (A)

POSTER SET-UP **7:30-17:00**
"Padova Fiere" (A)

PLENARY: UDO KRAGL **8:00-8:45**
Room: A1

BREAK **8:45-9:00**

PARALLEL SESSIONS **9:00-10:40**
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

COFFEE BREAK **10:40-11:00**

PARALLEL SESSIONS **11:00-12:20**
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

LUNCH 12:20-14:20

PARALLEL SESSIONS **14:20-15:55**
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

COFFEE BREAK **15:45-16:15**

PARALLEL SESSIONS **16:15-18:00**
"Padova Fiere" (A) and "Fiore di Botta" (B)

BREAK **18:00-18:20**

POSTER SESSION 1 (S1) **18:20-20:00**
"Padova Fiere" (A)

TUESDAY 20th JUNE

REGISTRATION **7:30-17:00**
"Padova Fiere" (A)

PLENARY: MASAKAZU AONO **8:00-8:45**
Room: A1

BREAK **8:45-9:00**

PARALLEL SESSIONS **9:00-10:40**
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

COFFEE BREAK **10:40-11:00**

PARALLEL SESSIONS **11:00-12:20**
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

LUNCH **12:20-14:20**

PARALLEL SESSIONS **14:20-15:55**
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

COFFEE BREAK **15:45-16:15**

PARALLEL SESSIONS **16:15-18:00**
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

BREAK **18:00-18:20**

PRESENTATIONS OF YOUNG SCIENTISTS AND MID CAREER AWARDS **18:20-20:05**
Room: A1

CONCERT **21:30**
"Sala dei Giganti" (G)

WEDNESDAY 21st JUNE

REGISTRATION **7:30-12:00**
"Padova Fiere" (A)

PLENARY: MOGENS MOGENSEN **8:00-8:45**
Room: A1

BREAK **8:45-9:00**

PARALLEL SESSIONS **9:00-10:40**
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

COFFEE BREAK **10:40-11:00**

PARALLEL SESSIONS **11:00-12:20**
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

LUNCH **12:20-14:00**

EXCURSION TO VENICE AND BANQUET **14:00**

THURSDAY 22nd JUNE

REGISTRATION **7:30-17:00**
"Padova Fiere" (A)

POSTER SET-UP **7:30-17:00**
"Padova Fiere" (A)

PLENARY: STANLEY WHITTINGHAM **8:00-8:45**
Room: A1

BREAK **8:45-9:00**

ISSI ELECTIONS **9:00-10:40**

"Padova Fiere" (A)

COFFEE BREAK 10:40-11:00

PARALLEL SESSIONS 11:00-12:20
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

LUNCH 12:20-14:20

PARALLEL SESSIONS 14:20-15:55
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

COFFEE BREAK 15:45-16:15

PARALLEL SESSIONS 16:15-18:00
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

BREAK 18:00-18:20

POSTER SESSION 2 (S2) 18:20-20:00
"Padova Fiere" (A)

FRIDAY 23rd JUNE

PARALLEL SESSIONS 8:00-10:40
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

COFFEE BREAK 10:40-11:00

PARALLEL SESSIONS 11:00-11:40
"Padova Fiere" (A) and *"Fiore di Botta"* (B)

BREAK 11:40-12:00

PLENARY: MICHAEL GRÄTZEL 12:00-12:45
Room: A1

CLOSING AND REMARKS 12:45-13:15
Room: A1

Tutorials

SUNDAY, 18 JUNE 2017
A: HALL 7 OF *"PADOVA FIERE"* – ROOM A5

8:00 – 11:15 **I**

IMPEDANCE SPECTROSCOPY IN SOLID STATE IONICS, FROM BASICS TO APPLICATIONS
Prof. Bernard Boukamp (University of Twente, The Neatherlands)
Dr. Dino Klotz (Technion, Israel).

11:15 – 13:05 **II**

NUCLEAR MAGNETIC RESONANCE IN SOLID STATE IONICS
Prof. Steve Greenbaum (Hunter College of the City University of New York, USA);
Dr. Mallory Gobet (Hunter College of the City University of New York, USA).

13: 35 – 15:25 **III**

NANOIONICS – FUNDAMENTALS AND APPLICATIONS
Prof. Joachim Maier (MPI for Solid State Research, Germany);
Dr. Rotraut Merkle (MPI for Solid State Research, Germany).

15:25 – 18:10 **IV**

NEUTRON SCATTERING TECHNIQUES IN THE STUDY OF SOLID-STATE ION-CONDUCTING MATERIALS
Dr. Joseph Dura (NIST);
Prof. Maths Karlsson (Chalmers University, Sweden);
Prof. Lorenzo Malavasi (University of Pavia, Italy).

Registration: 150 Euros/tutorial

Awards

2017 YSA FINALISTS AND MID-CAREER SCIENTIST AWARD (MIS – AWARD)

TUESDAY, 20 JUNE 2017
A: HALL 7 OF *"PADOVA FIERE"* –
–ROOM A1 (PLENARY ROOM)

18:20 – 18:35 **Study on H^- Conductive Oxyhydrides for Next-Generation Battery Systems**
Genki Kobayashi, Institute for Molecular Science (IMS), Research Center of Integrative Molecular Systems, Aichi, Japan

18:35 – 18:50 **Moving Ions for Function: The Intersection between Atomic Scale and Device Functionality**
Markus Kubicek, TU Wien, Institute of Chemical Technologies and Analytics, Wien, Austria

18:50 - 19:05 **Kinetics of Lithium Ion Insertion in Individual Battery Particles**
Yiyang Li, Materials Science & Engineering, Stanford University, Stanford, CA, USA

19:05 - 19:20 **Monitoring battery materials using advanced operando techniques**
Claire Villevieille, Paul Scherrer Institute – Electrochemistry Laboratory, Villigen, Switzerland

19:20 – 19:35 **On the ambiguous influence of soft lattices on ionic transport**
Wolfgang Zeier, Justus-Liebig-University Giessen, Institute of Physical Chemistry, Giessen, Germany

19:35 – 20:05 **Applications of Local Structural Probes to Study Structure and Dynamics in Battery and Fuel Cell Materials *in* and *ex-situ***
Clare P. Grey, University of Cambridge, UK

TECHNICAL SCHEDULE

TECHNICAL SCHEDULE – MACRO-AREA I

	SYMPOSIUM	SITE*	SUNDAY 18th JUNE				19:00 – 22:00
			9:20-10:40	11:00-12:20	14:20-15:55	16:15-18:00	
I-1	Beyond lithium batteries: ionic transport in post-Li systems						OPENING CEREMONY AND WELCOME PARTY
I-2	Advanced Lithium and Sodium Battery Electrode Materials	A		Room: A4			
				I-2/1	I-2/2	I-2/3	
I-3	All Solid-State Batteries	A		Room: A3			
			I-3/1: Polymer session	I-3/2: Na-conductors	I-3/3	I-3/4	
I-4	Ionics in "open" batteries (redox flow batteries)						
I-5	Polymer electrolyte ionomers: advances in cation- and anion-exchange membranes and ion conduction						
I-6	High-temperature proton-conducting polymer membranes						
I-7	"Polymer Electrolytes" - The ubiquity of ions and polymer materials in devices						
I-8	Ceramic Proton and Hydride Ion Conductors						
I-9	Solid oxide fuel cells and electrolyzers	A		Room: A2			
				I-9/1: SOFC Cathodes I	I-9/2: SOFC Anodes I	I-9/3: Modelling I	
I-10	Multi-functional oxide nanomaterials: from design to advanced applications						
I-11	Functional metal oxide interfaces in efficient electrochemical energy conversion, biomass conversion and charge storage systems						
I-12	Defect chemistry, transport and reactivity at gas/electrode interfaces						
I-13	Electro-chemo-mechanical coupling in energy storage and conversion materials						
I-14	Electrocatalysis at the electrode-solid electrolyte interface						
I-15	Photochemical and photocatalytic energy conversion						
I-16	Solar thermochemical cycles based on redox-active oxygen-conducting metal oxides						
I-17	Mesoscopic Solar Cells						

* SITE: A = Hall 7 of *"Padova Fiere"*
B = Campus *"Fiore di Botta"*

TECHNICAL SCHEDULE – MACRO-AREA I

	SITE*	8:00-8:45	MONDAY 19th JUNE 9:00-10:40	11:00-12:20	14:20-15:55	16:15-18:00	POSTER§	8:00-8:45	TUESDAY 20th JUNE 9:00-10:40	11:00-12:20
I-1	B	Plenary (A1): Udo Kragl	Room: B2				S1	Plenary (A1): Masakazu Aono	Room: B2	
			I-1/1	I-1/2	I-1/3	I-1/4			I-1/5	I-1/6
I-2	B		Room: B7						Room: B7	
			I-2/4	I-2/5	1-2/6	1-2/7			1-2/8	1-2/9
I-3	B		Room: B1						Room: B1	
			I-3/5: LLZO session 1	I-3/6: LLZO session 2	I-3/7: SSElectrolyte session 1	I-3/8: SSElectrolyte session 2			I-3/9: Battery session 1	I-3/10: Battery session 2
I-4	B		Room: B3				S1			
			I-4/1	I-4/2	I-4/3	I-4/4				
I-5										
I-6										
I-7	B		Room: B9				S1		Room: B9	
			I-7/1	I-7/2	I-7/3	I-7/4			I-7/5	I-7/6
I-8	A		Room: A3				S1		Room: A3	
			I-8/1	I-8/2	I-8/3	I-8/4			I-8/5	I-8/6
I-9	A		Room: A2						Room: A2	
			I-9/4: Modelling II	I-9/5: SOFC Cathodes II	I-9/6: Characterization I	I-9/7: SOFC Anodes II			I-9/8: SOFC Cathodes III- Ruddlesden-Popper-Phases	I-9/9: SOFC Cathodes IV - Stability Issues
I-10	B		Room: B6				S1		Room: B6	
			I-10/1	I-10/2	I-10/3	I-10/4			I-10/5	I-10/6
I-11										
I-12	B		Room: B10				S1		Room: B10	
			I-12/1	I-12/2	I-12/3	I-12/4			I-12/5	I-12/6
I-13	A						S1		Room: A5	
									I-13/1: Strain & Transport	I-13/2: Stress & Defect Chemistry
I-14	B		Room: B4				S1		Room: B4	
			I-14/1	I-14/2	I-14/3	I-14/4			I-14/5	I-14/6
I-15	A						S1		Room: A7	
									I-15/1	I-15/2
I-16										
I-17										

§ Poster sessions: 18:20-20:00, in Hall 7 of *"Padova Fiere"*

TECHNICAL SCHEDULE – MACRO-AREA I

	SYMPOSIUM	SITE	TUESDAY 20th JUNE 14:20-15:55	TUESDAY 20th JUNE 16:15-18:00	18:20-20:00	8:00-8:45	WEDNESDAY 21st JUNE 9:00-10:40	WEDNESDAY 21st JUNE 11:00-12:20
I-1	Beyond lithium batteries: ionic transport in post-Li systems	B			Presentations of Young Scientist and Mid-Career Awards (A1)	Plenary (A1): Mogens Mogensen	Room: B2 I-1/7	
I-2	Advanced Lithium and Sodium Battery Electrode Materials	B	Room: B7 I-2/10	Room: B7 I-2/11			Room: B7 I-2/12	Room: B7 I-2/13
I-3	All Solid-State Batteries	B	Room: B1 I-3/11: Battery session 3	Room: B1 I-3/12: Battery session 4			Room: B1 I-3/13: Battery session 5	Room: B1 I-3/14: Li-electrolytes
I-4	Ionics in "open" batteries (redox flow batteries)	B						
I-5	Polymer electrolyte ionomers: advances in cation- and anion-exchange membranes and ion conduction	B					Room: B9 I-5/1	Room: B9 I-5/2
I-6	High-temperature proton-conducting polymer membranes	B						
I-7	"Polymer Electrolytes" - The ubiquity of ions and polymer materials in devices	B	Room: B9 I-7/7	Room: B9 I-7/8				
I-8	Ceramic Proton and Hydride Ion Conductors	A	Room: A3 I-8/7	Room: A3 I-8/8			Room: A3 I-8/9	Room: A3 I-8/10
I-9	Solid oxide fuel cells and electrolyzers	A	Room: A2 I-9/10: Characterization II	Room: A2 I-9/11: Electrolytes I			Room: A2 I-9/12: SOEC - Proton Ceramic Electrolyzers	Room: A2 I-9/13: SOFC Cathodes V - Stability Issues
I-10	Multi-functional oxide nanomaterials: from design to advanced applications	B	Room: B6 I-10/7	Room: B6 I-10/8			Room: B6 I-10/9	Room: B6 I-10/10
I-11	Functional metal oxide interfaces in efficient electrochemical energy conversion, biomass conversion and charge storage systems	B		Room: B4 I-11/1			Room: B4 I-11/2	Room: B4 I-11/3
I-12	Defect chemistry, transport and reactivity at gas/electrode interfaces	B	Room: B10 I-12/7	Room: B10 I-12/8			Room: B10 I-12/9	Room: B10 I-12/10
I-13	Electro-chemo-mechanical coupling in energy storage and conversion materials	A	Room: A5 I-13/3: Materials Chemistry by Design	Room: A5 I-13/4: Analysis / Technique Development				
I-14	Electrocatalysis at the electrode-solid electrolyte interface	B	Room: B4 I-14/7					
I-15	Photochemical and photocatalytic energy conversion	A	Room: A7 I-15/3	Room: A7 I-15/4			Room: A7 I-15/5	Room: A7 I-15/6
I-16	Solar thermochemical cycles based on redox-active oxygen-conducting metal oxides	A					Room: A6 I-16/1	Room: A6 I-16/2
I-17	Mesoscopic Solar Cells	A						

TECHNICAL SCHEDULE – MACRO-AREA I

	SITE	8:00-8:45	9:00-10:40	THURSDAY 22nd JUNE 11:00-12:20	14:20-15:55	16:15-18:00	POSTER	FRIDAY 23rd JUNE 8:00-10:40	11:00-11:40	12:00-12:45	12:45-13:15
I-1	B	Plenary (A1): Stanley Whittingham	ISSI ELECTIONS							Plenary (A1): Michael Grätzel	Closing Ceremony and Remarks
I-2	B			Room: B7 I-2/14	I-2/15	I-2/16	S2	Room: B7 I-2/16	I-12/17		
I-3	B			Room: B1 I-3/15: Modelling session	I-3/16: Modelling /Interfaces	I-3/17	S2	Room: B1 I-3/18: Misc			
I-4	B							Room: B3 I-4/5			
I-5	B			Room: B9 I-5/3	I-5/4	I-5/5	S2	Room: B9 I-5/6	I-5/7		
I-6	B					Room: B10 I-6/1	S2	Room: B10 I-6/2	I-6/3		
I-7	B							Room: B5 I-7/9			
I-8	A										
I-9	A			Room: A2 I-9/14: SOFC Cathodes VI	I-9/15: SOFC Cathodes VII - Composites	I-9/16: SOFC Anodes III &SOECs	S2	Room: A2 I-9/17: Cells and Electrolytes II			
I-10	B			Room: B6 I-10/11	I-10/12	I-10/13		Room: B6 I-10/14			
I-11	B			Room: B4 I-11/4	I-11/5	I-11/6	S2	Room: B4 I-11/7			
I-12	B			Room: B10 I-12/11							
I-13											
I-14											
I-15											
I-16	A			Room: A6 I-16/3	I-16/4	I-16/5	S2				
I-17	A			Room: A7 I-17/1	I-17/2	I-17/3	S2	Room: A7 I-17/4	I-17/5		

TECHNICAL SCHEDULE – MACRO-AREA II, III AND IV

	SYMPOSIUM	SITE	SUNDAY 18th JUNE				
			9:20-10:40	11:00-12:20	14:20-15:55	16:15-18:00	19:00 – 22:00
II-1	Low-dimensional ionic and mixed ionic/electronic conductor nanostructures						OPENING CEREMONY AND WELCOME PARTY
II-2	Realization of new functional optoelectronic oxide based materials: experiment and theory						
II-3	The science and technology of 2D materials						
II-4	Ionics of Memristor/Resistive Switches						
III-1	Ionics meets bioscience						
III-2	Materials to Modulate Ionic Transport in Biological Systems						
IV-1	Modelling and simulation of ion-conducting materials						
IV-2	Advances in high spatial resolution probing of local heterogeneities in ion-conducting materials						
IV-3	Interfacial processes and nanoionics						
IV-4	Point defect chemistry of oxide materials						
IV-5	Transport in Morphologically Heterogeneous Porous Media: Advancing Characterization from In-Situ to In-Operando						
IV-6	Synchrotron and Neutron techniques for the study of ion-conducting materials						
IV-7	Nuclear Magnetic Resonance in Solid State Ionics						

TECHNICAL SCHEDULE – MACRO-AREA II, III AND IV

SITE		8:00-8:45	MONDAY 19th JUNE 9:00-10:40	11:00-12:20	14:20-15:55	16:15-18:00	POSTER	8:00-8:45	TUESDAY 20th JUNE 9:00-10:40	11:00-12:20
II-1		Plenary (A1): Udo Kragl						Plenary (A1): Masakazu Aono		
II-2										
II-3										
II-4	B								Room: B3	
									II-4/1	II-4/2
III-1	B				Room B8		S1			
					III-1/1	III-1/2				
III-2	B						S1		Room: B8	
									III-2/1	III-2/2
IV-1	B		Room B5				S1		Room B5	
			IV-1/1	IV-1/2	IV-1/3	IV-1/4			IV-1/5	IV-1/6
IV-2	A		Room A4				S1			
			IV-2/1	IV-2/2	IV-2/3	IV-2/4				
IV-3										
IV-4										
IV-5	A		Room A5				S1			
			IV-5/1	IV-5/2	IV-5/3	IV-5/4				
IV-6	A		Room A6				S1		Room A6	
			IV-6/1: OPERANDO batteries	IV-6/2: OPERANDO batteries	IV-6/3: Dynamics	IV-6/4: Dynamics			IV-6/5: Polymers Structure	IV-6/6: Polymers Structure
IV-7										

TECHNICAL SCHEDULE – MACRO-AREA II, III AND IV

	SYMPOSIUM	SITE	TUESDAY 20th JUNE 14:20-15:55	TUESDAY 20th JUNE 16:15-18:00	18:20-20:00	8:00-8:45	WEDNESDAY 21st JUNE 9:00-10:40	WEDNESDAY 21st JUNE 11:00-12:20
II-1	Low-dimensional ionic and mixed ionic/electronic conductor nanostructures	A			Presentations of Young Scientist and Mid Career Awards (A1)	Plenary (A1): Mogens Mogensen	Room: A5 II-1/1	II-1/2
II-2	Realization of new functional optoelectronic oxide based materials: experiment and theory	B	Room: B2 II-2/1	II-2/2				
II-3	The science and technology of 2D materials	B		Room: M3 II-3/1				Room: B2 II-3/2
II-4	Ionics of Memristor/Resistive Switches	B	Room: B3 II-4/3	II-4/4			Room: B3 II-4/5	II-4/6
III-1	Ionics meets bioscience							
III-2	Materials to Modulate Ionic Transport in Biological Systems	B	Room: B8 III-2/3	III-2/4				
IV-1	Modelling and simulation of ion-conducting materials							
IV-2	Advances in high spatial resolution probing of local heterogeneities in ion-conducting materials							
IV-3	Interfacial processes and nanoionics	B	Room: B5 IV-3/1	IV-3/2			Room: B5 IV-3/3	IV-3/4
IV-4	Point defect chemistry of oxide materials	A	Room: A4 IV-4/1	IV-4/2			Room: A4 IV-4/3	IV-4/4
IV-5	Transport in Morphologically Heterogeneous Porous Media: Advancing Characterization from In-Situ to In-Operando							
IV-6	Synchrotron and Neutron techniques for the study of ion-conducting materials	A	Room: A6 IV-6/7: Oxides Structure					
IV-7	Nuclear Magnetic Resonance in Solid State Ionics							

TECHNICAL SCHEDULE – MACRO-AREA II, III AND IV

TECHNICAL SCHEDULE - MACRO-AREA II, III AND IV

	SITE	8:00-8:45	9:00-10:40	THURSDAY 22nd JUNE 11:00-12:20	14:20-15:55	16:15-18:00	POSTER	FRIDAY 23rd JUNE 8:00-10:40	11:00-11:40	12:00-12:45	12:45-13:15
II-1	A	Plenary (A1): Stanley Whittingham	ISSI ELECTIONS	Room: A5 II-1/3	II-1/4	Joint session (A3)	S2	Room: A5 II-1/5	II-1/6	Plenary (A1): Michael Grätzel	Closing Ceremony and Remarks
II-2	B			Room: B8 II-2/3			S2				
II-3	B			Room: B2 II-3/3	II-3/4	II-3/5	S2	Room: B2 II-3/6			
II-4	B			Room: B3 II-4/7	II-4/8		S2				
III-1	B					Room B8 III-1/3	S2	Room B8 III-1/4			
III-2							S2				
IV-1											
IV-2											
IV-3	B			Room: B5 IV-3/5	IV-3/6		S2				
IV-4	A			Room: A3 IV-4/5	IV-4/6	IV-4/7	S2	Room: A3 IV-4/8	IV-4/9		
IV-5											
IV-6											
IV-7	A					Room: A4 IV-7/1	S2	Room: A4 IV-7/2			

POSTER SESSIONS

Two Poster sessions are held on area P of Site A "Padua Fiera".
Session 1 (S1): Monday 19th June from 18:20 to 20:00
Session 2 (S2): Thursday 22nd June from 18:20 to 20:00

MACRO AREA 1: IONICS IN ENERGY AND ENVIRONMENT

I-1 – BEYOND LITHIUM BATTERIES: IONIC TRANSPORT IN POST-LI SYSTEMS (S1) *19th JUNE*

Code	Presenter
I-1_1/P	Elena Arroyo-de Dompablo
I-1_2/P	Jae-Kwang Kim
I-1_3/P	Ting Hei Wan
I-1_4/P	Yuyu Li
I-1_5/P	Stanislav Fedotov
I-1_6/P	Katsuro Hayashi
I-1_7/P	Yugal Kishor Mahipal
I-1_8/P	Yulia Mateyshina
I-1_9/P	Claudio Gerbaldi
I-1_10/P	Ji Heon Ryu
I-1_11/P	Andrea La Monaca
I-1_12/P	Julia Amici
I-1_13/P	Usman Zubair
I-1_14/P	Younki Lee
I-1_15/P	Younki Lee
I-1_16/P	Osamu Yamamoto
I-1_17/P	Martin Philipp
I-1_18/P	Valentina Dall'Asta
I-1_19/P	Biswajit Mandal

I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS (S2) *22th JUNE*

Code	Presenter
I-2_1/P	Yunxia Liu
I-2_2/P	Jaein Lee
I-2_3/P	Danuta Olszewska
I-2_4/P	Qing Xia
I-2_5/P	Kwang Bum Kim
I-2_6/P	Hanxing Liu
I-2_7/P	Zhiyong Yu
I-2_8/P	Danuta Olszewska
I-2_9/P	Janina Molenda
I-2_10/P	Janina Molenda
I-2_11/P	Janina Molenda
I-2_12/P	Janina Molenda
I-2_13/P	Janina Molenda
I-2_14/P	Baster Dominika
I-2_15/P	Baster Dominika
I-2_16/P	Wioleta Ślubowska
I-2_17/P	Niv Aloni
I-2_18/P	Janina Molenda
I-2_19/P	Janina Molenda
I-2_20/P	Lee Gi-Hyeok
I-2_21/P	Adjei Agyeman Daniel
I-2_22/P	Yang Junghoon
I-2_23/P	Doretta Capsoni
I-2_24/P	Xiang Li
I-2_25/P	Yonghong Deng
I-2_26/P	Savitha Thayumanasundaram
I-2_27/P	Jun Ho Song
I-2_28/P	Tatsuya Nakamura
I-2_29/P	Elizaveta Evschik
I-2_30/P	Michał Świętosławski
I-2_31/P	Ji Heon Ryu
I-2_32/P	Gen Hasegawa
I-2_33/P	Przemyslaw Michalski
I-2_34/P	Tomasz Pietrzak
I-2_35/P	Daiki Maeda
I-2_36/P	Mariasole Di Carli
I-2_37/P	XiangXin Guo
I-2_38/P	Bakierska Monika
I-2_39/P	Britta Teßmer
I-2_40/P	Kim Jongjung
I-2_41/P	Zhaoyin Wen
I-2_42/P	Zhaoyin Wen
I-2_43/P	Rajendra Kumar Singh
I-2_44/P	Rajendra Kumar Singh
I-2_45/P	Olga Bushkova
I-2_46/P	Marcin Molenda
I-2_47/P	Świder Joanna
I-2_48/P	Puteh Melor Wesma Salehen
I-2_49/P	Priimägi Priit
I-2_50/P	Kazuto Koganei
I-2_51/P	Hironori Kobayashi
I-2_52/P	Michał Świętosławski
I-2_53/P	Gai Yang
I-2_54/P	Bo Wang
I-2_55/P	Patrick Posch
I-2_56/P	Flaminia Rondino
I-2_57/P	S Jayalekshmi
I-2_58/P	Zhaoxiang Wang
I-2_59/P	Yan Yu
I-2_60/P	Svetoslava Vankova
I-2_61/P	Alessandro Palmieri
I-2_62/P	Mauro Pasquali
I-2_63/P (I-2_2/O)	Monika Bakierska

I-3 – ALL SOLID-STATE BATTERIES (S2) *22th JUNE*

Code	Presenter
I-3_1/P	Xin Guo
I-3_2/P	Lu Wei
I-3_3/P	Jinli Qiao
I-3_4/P	Yongcheng Jin
I-3_5/P	Markus Kubicek
I-3_6/P	Mitsuharu Tabuchi
I-3_7/P	Nobuya Machida
I-3_8/P	Konrad Kwatek
I-3_9/P	Konrad Kwatek
I-3_10/P	Misae Otoyama
I-3_11/P	Pan MengYing
I-3_12/P	Kenji Nagao
I-3_13/P	Ting Hei Wan
I-3_14/P	So Yubuchi
I-3_15/P	Fumika Tsuji
I-3_16/P	Atsutaka Kato
I-3_17/P	Hirofumi Tsukasaki
I-3_18/P	Xiaohan Wu
I-3_19/P	Giulio Ferraresi
I-3_20/P	Cynthia Martinez-Cisneros
I-3_21/P	Li-Zhen Fan
I-3_22/P	Ning Zhao
I-3_23/P	Nobuyuki Zettsu
I-3_24/P	Jakub Zagorski
I-3_25/P	Sascha Harm
I-3_26/P	Yağmur Deniz
I-3_27/P	Nobuyuki Zettsu
I-3_28/P	Nobuyuki Zettsu
I-3_29/P	Svetlana Novikova
I-3_30/P	Rajendra Kumar Singh
I-3_31/P	Naoaki Kuwata
I-3_32/P	Masanobu Chiku
I-3_33/P	Masahiro Tatsumisago
I-3_34/P	Wolfgang Stein
I-3_35/P	Yoshiyuki Kowada
I-3_36/P	Sung Hoo Jung
I-3_37/P	Tsubasa Fujiwara
I-3_38/P	Aiko Nakao
I-3_39/P	Jang Myoun Ko
I-3_40/P	Yoshiyuki Inaguma
I-3_41/P	Jong-Sook Lee
I-3_42/P	Jong-Sook Lee
I-3_43/P	Mari Yamamoto-Kiryu
I-3_44/P	Keiichiro Ota
I-3_45/P	Prasada Rao Rayavarapu
I-3_46/P	Masanari Takahashi
I-3_47/P	Akiko Tsurumaki
I-3_48/P	Annika Baumann
I-3_49/P	A.K. Ola Hekselman
I-3_50/P	Bjorn Joos
I-3_51/P	Andriy Kvasha
I-3_52/P	Isabel Hanghofer
I-3_53/P	Jong-Sook Lee
I-3_54/P	Francesco Ciucci
I-3_55/P	Rajendra Kumar Singh

I-4 – IONICS IN "OPEN" BATTERIES (REDOX FLOW BATTERIES) (S1)
19th JUNE

Code	Presenter
I-4_1/P	Anna Chiara Tizzoni
I-4_2/P	Kyeongmin Oh
I-4_3/P	Kyeongmin Oh
I-4_4/P	Catia Arbizzani
I-4_5/P	Faiza Summer
I-4_6/P	Chuanyu Sun

I-5 –POLYMER ELECTROLYTE IONOMERS: ADVANCES IN CATION- AND ANION-EXCHANGE MEMBRANES AND ION CONDUCTION (S2) 22ND June

Code	Presenter
I-5_1/P	Ruslan Kayumov
I-5_2/P	Evgeny Sanginov
I-5_3/P	Ivan Vito Ferrari
I-5_4/P	Anna Donnadio
I-5_5/P	Elisabetta Troni
I-5_6/P	Roberto D'Amato

I-6 – HIGH-TEMPERATURE PROTON-CONDUCTING POLYMER MEMBRANES (S2) *22nd JUNE*

Code	Presenter
I-6_1/P	Takahiro Ichikawa
I-6_2/P	Einars Sprugis

I-7 – "POLYMER ELECTROLYTES" - THE UBIQUITY OF IONS AND POLYMER MATERIALS IN DEVICES) (S1)
19th JUNE

Code	Presenter
I-7_1/P	Takahito Itoh
I-7_2/P	Kwang Man Kim
I-7_3/P	Jumi Kim
I-7_4/P	Yoichi Tominaga
I-7_5/P	Sayan Das
I-7_6/P	Takahiro Ichikawa
I-7_7/P	Heng Zhang
I-7_8/P	Cynthia Martinez-Cisneros
I-7_9/P	Judith Cardoso
I-7_10/P	Francisco de Paula Martin Jimenez
I-7_11/P	Maurizio Furlani
I-7_12/P	Mariano Grünebaum
I-7_13/P	Anna Gerlitz
I-7_14/P	Marisa Falco
I-7_15/P	Barbora Galajdová
I-7_16/P	Rajendra Kumar Singh
I-7_17/P	Nicolas Goujon
I-7_18/P	Rakesh Agrawal
I-7_19/P	Daisuke Fukuma
I-7_20/P	Karol Pożyczka
I-7_21/P	Guzmán Gregorio
I-7_22/P	Jungdon Suk
I-7_23/P	Mijeong Han
I-7_24/P	Rajiv Kumar
I-7_25/P	Sheida Hosseinioun
I-7_26/P	Laura Imholt
I-7_27/P	Dale Teeters
I-7_28/P	Marco Castriota
I-7_29/P	Filipe Figueiredo

I-8 – CERAMIC PROTON AND HYDRIDE ION CONDUCTORS (S1)
19th JUNE

Code	Presenter
I-8_1/P	Kavitha K.
I-8_2/P	Bhupendra Singh
I-8_3/P	Nataliia Tarasova
I-8_4/P	Dmitry Medvedev
I-8_5/P	Julia Lyagaeva
I-8_6/P	Donglin Han
I-8_7/P	Donglin Han
I-8_8/P	Rotraut Merkle
I-8_9/P	Alexander Kolchugin
I-8_10/P	Alexander Kolchugin
I-8_11/P	Ekaterina Antonova
I-8_12/P	Andrei Farlenkov
I-8_13/P	Tarasova Nataliia
I-8_14/P	Anastasios Vourros
I-8_15/P	A.V. Shlyakhtina
I-8_16/P	Genki Kobayashi
I-8_17/P	Fabian Draber
I-8_18/P	Tarasova Nataliia
I-8_19/P	Haruyuki Takahashi
I-8_20/P	Kenta Hoshino
I-8_21/P	Jong Hoon Joo
I-8_22/P	Kacper Dzierzgowski
I-8_23/P	Tarjei Bondevik
I-8_24/P	Piotr Winiarz
I-8_25/P	Tomohiro Ishiyama
I-8_26/P	Ivan Ivanov
I-8_27/P	Tzouliana Kraia
I-8_28/P	Elena Rebollo
I-8_29/P	Laura Rioja-Monllor
I-8_30/P	Yuichi Mikami
I-8_31/P	Tomohiro Kuroha
I-8_32/P	Chiharu Kura
I-8_33/P	Takahisa Omata
I-8_34/P	Laura Mazzei
I-8_35/P	Maria Gazda
I-8_36/P	Junichiro Otomo
I-8_37/P	Jong-Sook Lee
I-8_38/P	Naoki Hamao
I-8_39/P	Arthur Bourdon
I-8_40/P	Yasuhiro Takamura
I-8_41/P	Jose Manuel Serra
I-8_42/P	Seikh M Habibur Rahman
I-8_43/P	Mateusz Tarach

I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS (S2) *22nd JUNE*

Code	Presenter
I-9_1/P	Lyudmyla Stackpool
I-9_2/P	Nikolaos Kaklidis
I-9_3/P	Pilar Padilla
I-9_4/P	Edith Bucher
I-9_5/P	Nikolaj Danilov
I-9_6/P	Liubov Skutina
I-9_7/P	Tobias Huber
I-9_8/P	Xiaomei Liu
I-9_9/P	Denis Osinkin
I-9_10/P	Tohru Yamamoto
I-9_11/P	Valentina Voronkova
I-9_12/P	Valentina Voronkova
I-9_13/P	Denis Osinkin
I-9_14/P	Francesca Zurlo
I-9_15/P	A. Nemudry
I-9_16/P	Hyung-Tae Lim
I-9_17/P	Elena Pikalova
I-9_18/P	Hyung-Tae Lim
I-9_19/P	Elena Pikalova
I-9_20/P	Jun-Young Park
I-9_21/P	Wojciech Skubida
I-9_22/P	Alexander Kolchugin
I-9_23/P	Saurabh Singh
I-9_24/P	Wenyi Tan
I-9_25/P	Nicoleta Cioateră
I-9_26/P	Elena-Adriana Voinea
I-9_27/P	Meina Chen
I-9_28/P	Reiichi Chiba
I-9_29/P	Pravin Kumar
I-9_30/P	Vasileios Kyriakou
I-9_31/P	Xiaomei Liu
I-9_32/P	Qiang Li
I-9_33/P	Joon Hyung Shim
I-9_34/P	Haruo Kishimoto
I-9_35/P	Sergey Bychkov
I-9_36/P	Elena Pikalova
I-9_37/P	Maria Morozova
I-9_38/P	Maria Morozova
I-9_39/P	Lana-Simone Unger
I-9_40/P	Dong Min Kim
I-9_41/P	Maria Morozova
I-9_42/P	Chengjun Zhu
I-9_43/P	Francesca Drago
I-9_44/P	Vladyslav Tezyk
I-9_45/P	Francesco Chiabrera
I-9_46/P	Haruo Kishimoto
I-9_47/P	Nikolay Lyskov
I-9_48/P	Florian Wankmüller
I-9_49/P	José Santiso
I-9_50/P	Raghvendra Pandey
I-9_51/P	Nadezhda Tsvetkova

I-9_52/P	Mohammad Hossein Paydar
I-9_53/P	Mattia Saccoccio
I-9_54/P	Aleksey Yaremchenko
I-9_55/P	Hui Zhao
I-9_56/P	Nikolaenko Irina
I-9_57/P	Liubov Skutina
I-9_58/P	Wojciech Wrobel
I-9_59/P	Jong-Sook Lee
I-9_60/P	Jong-Sook Lee
I-9_61/P	Albert Taracon, Alex Morata
I-9_62/P	Mihkel Vestli
I-9_63/P	David Mebane
I-9_64/P	Jakub Karczewski
I-9_65/P	Jakub Karczewski
I-9_66/P	Beata Bochentyn
I-9_67/P	Beata Bochentyn
I-9_68/P	Gilles Gauthier
I-9_69/P	Gilles Gauthier
I-9_70/P	Mohammad Hossein Paydar
I-9_71/P	Yao Wang
I-9_72/P	Elisabeth Djurado
I-9_73/P	Gilles Gauthier

I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS
(S1) *19th JUNE*

Code	Presenter
I-10_1/P	Mantas Sriubas
I-10_2/P	Igor Luisetto
I-10_3/P	Sunhye Yang
I-10_4/P	Marcella Bini
I-10_5/P	Francesco Ciucci
I-10_6/P	Nursultan Kainbayev
I-10_7/P	Te- Hua Fang
I-10_8/P	Tripathi Alok Kumar
I-10_9/P	Harish Parala
I-10_10/P	Virginia Wilde
I-10_11/P	Liping Sun
I-10_12/P	Tihana Čižmar
I-10_13/P	Davide Barreca
I-10_14/P	Alberto Gasparotto
I-10_15/P	Chiara Maccato
I-10_16/P	Giorgio Carraro
I-10_17/P	Ettore Fois
I-10_18/P	Jose Ramos-Barrado
I-10_19/P	Olena Pliekhova
I-10_20/P	Francesca Visentin
I-10_21/P	Dongwei Du
I-10_22/P	Barbara Ballarin
I-10_23/P	Umberto Anselmi Tamburini
I-10_24/P	Tripathi Alok Kumar
I-10_25/P	Silvia Bodoardo
I-10_26/P	Haifa Hamrouni
I-10_27/P	Tso-Fu Mark Chang
I-10_28/P	Tso-Fu Mark Chang
I-10_29/P	Irina Nikolaenko
I-10_30/P	Chun-Yi Chen
I-10_31/P	Haifa Hamrouni
I-10_32/P	Imen Jaouali

I-11 – FUNCTIONAL METAL OXIDE INTERFACES IN EFFICIENT ELECTROCHEMICAL ENERGY CONVERSION, BIOMASS CONVERSION AND CHARGE STORAGE SYSTEMS **(S2)**
22nd JUNE

Code	Presenter
I-11_1/P	Fontaine Marie-Laure

I-12 – DEFECT CHEMISTRY, TRANSPORT AND REACTIVITY AT GAS/ELECTRODE INTERFACES
(S1) *19th JUNE*

Code	Presenter
I-12_1/P	Geyu Lu
I-12_2/P	Rotraut Merkle
I-12_3/P	Anna Niemczyk
I-12_4/P	Anna Olszewska
I-12_5/P	Konrad Świerczek
I-12_6/P	Zijia Zhang
I-12_7/P	Alexander Schmid
I-12_8/P	Atsushi Mineshige
I-12_9/P	Sergey Bychkov
I-12_10/P	Alexey Suntsov
I-12_11/P	David Mueller
I-12_12/P	Ji Haeng Yu
I-12_13/P	Markus Kubicek
I-12_14/P	Anton Sednev
I-12_15/P	Marzena Leszczynska
I-12_16/P	Andreas Nenning
I-12_17/P	Alexey Markov
I-12_18/P	Riyan Achmad Budiman
I-12_19/P	Anna Magrasó
I-12_20/P	Kuan-Zong Fung
I-12_21/P	Pavlos Pandis

I-13 – ELECTRO-CHEMO-MECHANICAL COUPLING IN ENERGY STORAGE AND CONVERSION MATERIALS
(S1) *19th JUNE*

Code	Presenter
I-13_1/P	Dmitry Medvedev
I-13_2/P	Marcin Malys
I-13_3/P	Vladimir Sereda
I-13_4/P	Fumitada Iguchi

I-14 – ELECTROCATALYSIS AT THE ELECTRODE-SOLID ELECTROLYTE INTERFACE
(S1) *19th JUNE*

Code	Presenter
I-14_1/P	George-Octavian Buica
I-14_2/P	Li-Zhen Fan
I-14_3/P	Lorenzo Pezzolato
I-14_4/P	Ji-Haeng Yu
I-14_5/P	Yannick Herve Bang
I-14_6/P	Angeloclaudio Nale

I-15 – PHOTOCHEMICAL AND PHOTOCATALYTIC ENERGY CONVERSION **(S1) *19th JUNE***

Code	Presenter
I-15_1/P	Gunars Bajars
I-15_2/P	Simely Hermandez
I-15_3/P	Karima Ayeb
I-15_4/P	Farabi Bozheyev

I-17 – MESOSCOPIC SOLAR CELLS **(S2)**
22nd JUNE

Code	Presenter
I-17_1/P	Gee Yeong Kim
I-17_2/P	Dong-Won Kang
I-17_3/P	Jelena Popovic
I-17_4/P	Carmen Cavallo

MACRO-AREA II: IONICS IN COMMUNICATION AND ROBOTICS

II-1 – LOW-DIMENSIONAL IONIC AND MIXED IONIC/ELECTRONIC CONDUCTOR NANOSTRUCTURES
(S2) ***22nd JUNE***

Code	Presenter
II-1_1/P	Bonjae Koo

II-2 – REALIZATION OF NEW FUNCTIONAL OPTOELECTRONIC OXIDE BASED MATERIALS: EXPERIMENT AND THEORY **(S2)**
22nd JUNE

Code	Presenter
II-2_1/P	Marina Muñoz-Castro

II-3 – THE SCIENCE AND TECHNOLOGY OF 2D MATERIALS **(S2)**
22nd JUNE

Code	Presenter
II-3_1/P	Irina Nikolaenko
II-3_2/P	Fabio C. Fonseca
II-3_3/P	Yulia Mateyshina
II-3_4/P	Anna-Katharina Hatz

II-4 – IONICS OF MEMRISTOR/RESISTIVE SWITCHES **(S2)**
22nd JUNE

Code	Presenter
II-4_1/P	Sunho Kim
II-4_2/P	Alexandra von der Heiden
II-4_3/P	Karol Frohlich

MACRO-AREA III: IONICS IN COMMUNICATION AND ROBOTICS

III-1 – IONICS MEETS BIOSCIENCE (S1)
19th JUNE

Code	Presenter
III-1_1/P	Korakot Sombatmankhong
III-1_2/P	Hiroyuki Ohno
III-1_3/P	Nobuhumi Nakamura
III-1_4/P	Francesca Visentin
III-1_5/P	Hideki Hanabusa
III-1_6/P	Keigo Ishii
III-1_7/P	Shiori Suzuki
III-1_8/P	Hiroyuki Ohno
III-1_9/P	Hiroyuki Ohno
III-1_10/P	Hiroyuki Ohno
III-1_11/P	Umberto Anselmi-Tamburini

III-2 - MATERIALS TO MODULATE IONIC TRANSPORT IN BIOLOGICAL SYSTEMS (S1)
19th JUNE

Code	Presenter
III-2_1/P	Takashi Kawabata
III-2_2/P	Hitoki Semizo
III-2_3/P	Yolina Hubenova
III-2_4/P	Seung-Yun Lee

MACRO-AREA IV: GENERAL ASPECTS, FUNDAMENTALS AND THEORY IN ION-CONDUCTING MATERIALS

IV-1 – MODELLING AND SIMULATION OF ION-CONDUCTING MATERIALS (S1)
19th JUNE

Code	Presenter
IV-1_1/P	Vitaly Sinitsyn
IV-1_2/P	Konrad Świerczek
IV-1_3/P	Steffen Grieshammer
IV-1_4/P	Osamu Kamishima
IV-1_5/P	Paweł Ławniczak
IV-1_6/P	Dmytro Bletskan

IV-2 – ADVANCES IN HIGH SPATIAL RESOLUTION PROBING OF LOCAL HETEROGENEITIES IN ION-CONDUCTING MATERIALS (S1)
19th JUNE

Code	Presenter
IV-2_1/P	Ester García-González
IV-2_2/P	Koji Shimizu
IV-2_3/P	Peter Crozier
IV-2_4/P	William Bowman

IV-3 – INTERFACIAL PROCESSES AND NANOIONICS (S2)
22nd JUNE

Code	Presenter
IV-3_1/P	Chia-Chin Chen
IV-3_2/P	Stefanie Taibl
IV-3_3/P	Michael Weissmayer
IV-3_4/P	Dalius Petrulionis
IV-3_5/P	Tobias Huber
IV-3_6/P	Filipe Figueiredo

IV-4 – POINT DEFECT CHEMISTRY OF OXIDE MATERIALS (S2)
22nd JUNE

Code	Presenter
IV-4_1/P	Eugene Kotomin
IV-4_2/P	Jianmin Shi
IV-4_3/P	Yeong-Cheol Kim
IV-4_4/P	Irina Piir
IV-4_5/P	Dmitry Malyshkin
IV-4_6/P	Dmitry Tsvetkov
IV-4_7/P	Boris Politov
IV-4_8/P	Nadezhda Tsvetkova
IV-4_9/P	Konstantin Chesnokov
IV-4_10/P	Yuval Elbaz
IV-4_11/P	Annika Buchheit
IV-4_12/P	Jakyu Chun

IV-5 – TRANSPORT IN MORPHOLOGICALLY HETEROGENEOUS POROUS MEDIA: ADVANCING CHARACTERIZATION FROM IN-SITU TO IN-OPERANDO (S1)
19th JUNE

Code	Presenter
IV-5_1/P	Natalia Porotnikova
IV-5_2/P	Maxim Vlasov
IV-5_3/P	Evgeny Tropin
IV-5_4/P	Judith Cardoso

IV-6 – SYNCHROTRON AND NEUTRON TECHNIQUES FOR THE STUDY OF ION-CONDUCTING MATERIALS (S1)
19th JUNE

Code	Presenter
IV-6_1/P	Teruyoshi Awano
IV-6_2/P	Atsushi Mineshige

IV-7 – NUCLEAR MAGNETIC RESONANCE IN SOLID STATE IONICS (S2)
22nd JUNE

Code	Presenter
IV-7_1/P	Tatiana Zinkevich
IV-7_2/P	Heike Stöffler
IV-7_3/P	Chiara Ferrara
IV-7_4/P	Ruslan Kayumov
IV-7_5/P	Sarah Lunghammer

SUNDAY 18th JUNE

I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS			*I-3 – ALL SOLID-STATE BATTERIES*			*I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS*		
Room: A4			**Room: A3**			**Room: A2**		
08:45-09:00		**BREAK**	**08:45-09:40**		**BREAK**	**08:45-09:00**		**BREAK**
			I-3/1: Polymer session					
			Chairpersons: Yoon Soek Jung, Daniel Rettenwander					
			9:40-10:00	I-3_1/O	S. Selvasekarapandian			
			10:00-10:20	I-3_2/O	N. Rai			
			10:20-10:40	I-3_3/O	R. Prasad Kumhar			
10:40-11:00		**COFFEE BREAK**	**10:40-11:00**		**COFFEE BREAK**	**10:40-11:00**		**COFFEE BREAK**
I-2/1			**I-3/2: Na-conductors**			**I-9/1: SOFC Cathodes Session I**		
Chairpersons: Craig Fisher, Cristina Tealdi			**Chairpersons: Yang Shao Horn, Daniel Rettenwander**			**Chairperson: Werner Sitte**		
11:00-11:20	I-2_1/O	Natasha Ross	11:00-11:25	I-3_4/I	Brian Sheldon	11:00-11:25	I-9_1/I	Helena Tellez
11:20-11:40	I-2_2/O	Monika Bakierska	11:25-11:45	I-3_5/O	Andreas Nenning	11:25-11:45	I-9_2/O	Rose-Noëlle Vannier
11:40-12:00	I-2_3/O	Svetlana Novikova	11:45-12:05	I-3_6/O	Sahir Naqash	11:45-12:05	I-9_3/O	Gilles Gauthier
12:00-12:20	I-2_4/O	Wensheng Yang	12:05-12:25	I-3_7/O	He Wang	12:05-12:25	I-9_4/O	Rose-Noelle Vannier
12:20-12:40	I-2_5/O	M. Kalpana	12:25-12:45	I-3_8/O	Byoungwoo Kang	12:25-12:45	I-9_5/O	Susana García-Martín
12:40-14:20		**LUNCH**	**12:45-14:20**		**LUNCH**	**12:45-14:20**		**LUNCH**
I-2/2			**I-3/3**			**I-9/2: SOFC Anodes Session I**		
Chairpersons: Aleksandar Matic, Cristina Tealdi			**Chairpersons: Brian Sheldon, Craig Fisher**			**Chairperson: Peter Vang Hendriksen**		
14:20-14:40	I-2_6/O	Zongping Shao	14:20-14:45	I-3_9/I	Ryoji Kanno	14:20-14:45	I-9_6/I	Theis Skafte
14:40-15:00	I-2_7/O	Yair Ein-Eli	14:45-15:05	I-3_10/O	Yang Hu	14:45-15:05	I-9_7/O	A. Yaremchenko
15:00-15:20	I-2_8/O	Hailei Zhao	15:05-15:25	I-3_11/O	Seitaro Ito	15:05-15:25	I-9_8/O	K. Eguchi
15:20-15:40	I-2_9/O	Li-Zhen Fan	15:25-15:45	I-3_12/O	Daniele Pontiroli	15:25-15:45	I-9_9/O	B. Bochentyn
			15:45-16:05	I-3_13/O	Philippe Vereecken			
15:40-16:15		**COFFEE BREAK**	**16:05-16:15**		**COFFEE BREAK**	**15:45-16:15**		**COFFEE BREAK**
I-2/3			**I-3/4**			**I-9/3: Modelling Session I**		
Chairpersons: Aleksandar Matic, Cristina Tealdi			**Chairpersons: Brian Sheldon, Craig Fisher**			**Chairperson: Jeong Woo Han**		
16:15-16:35	I-2_10/O	Yanglong Hou	16:25-16:50	I-3_14/I	Steven Visco	16:15-16:40	I-9_10/I	D. Morgan
16:35-16:55	I-2_11/O	Niloofar Ehteshami	16:50-17:10	I-3_15/O	S. Granados-Focil	16:40-17:00	I-9_11/O	J. Wu
16:55-17:15	I-2_12/O	Fu-Ming Wang	17:10-17:30	I-3_16/O	M. Graczyk-Zajac	17:00-17:20	I-9_12/O	K. Kim
			17:30-17:50	I-3_17/O	Shigang Ling	~~17:20-17:40~~	~~I-9_13/O~~	~~Y. Gao~~
						17:40-18:00	I-9_14/O	J. M. Serra
19:00 - 20:00		**OPENING CEREMONY & WELCOME PARTY**						

MONDAY 19th JUNE

I-1 – BEYOND LITHIUM BATTERIES: IONIC TRANSPORT IN POST-LI SYSTEMS	*I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS*	*I-3 – ALL SOLID-STATE BATTERIES*	*I-4 – IONICS IN "OPEN" BATTERIES*
Room: B2	**Room: B7**	**Room: B1**	**Room: B3**
	Chairperson: Hiroyuki Ohno		
08:00-08:45	**PLENARY – Udo Kragl**		
08:45-09:00 BREAK	**08:45-09:00 BREAK**	**08:45-09:00 BREAK**	**08:45-09:00 BREAK**
I-1/1	**I-2/4**	**I-3/5: LLZO session 1**	**I-4/1: Redox Flow Batteries**
Chairpersons: John Muldoon, Federico Bertasi	**Chairpersons: Margret Wohlfahrt-Mehrens, Stefano Passerini**	**Chairpersons: Jennifer Rupp, Eric Wachsman**	**Chairperson: Massimo Guarnieri**
9:00-9:25 I-1_1/I Brian Ingram	9:00-9:30 I-2_13/K Saiful Islam	9:30-9:55 I-3_18/I S. Uhlenbruck	9:00-9:25 I-4_1/I Ulrich S. Schubert
9:25-9:50 I-1_2/I Elsa Roedern	9:30-9:50 I-2_14/O Wang Pengfei	9:55-10:15 I-3_19/O M. Wilkening	9:25-9:50 I-4_2/I Wei Wang
9:50-10:15 I-1_3/I Wei-Qiang Han	9:50-10:10 I-2_15/O Evvy Kartini	10:15-10:35 I-3_20/O R. Brugge	9:50-10:15 I-4_3/I Brett Helms
10:15-10:35 I-1_4/O Jan Bitenc	10:10-10:30 I-2_16/O Hongze Gao		10:15-10:35 I-4_4/O Matteo Gigli
10:35-11:00 COFFEE BREAK	**10:30-11:00 COFFEE BREAK**	**10:35-11:00 COFFEE BREAK**	**10:35-11:00 COFFEE BREAK**
I-1/2	**I-2/5**	**I-3/6: LLZO session 2**	**I-4/2**
Chairpersons: John Muldoon, Federico Bertasi	**Chairpersons: Christian Masquelier, Stefano Passerini**	**Chairpersons: Jennifer Rupp, Eric Wachsman**	**Chairperson: Silvia Licoccia**
11:00-11:25 I-1_5/I Fride Vullum-Bruer	11:00-11:25 I-2_17/I Teófilo Rojo	11:00-11:25 I-3_21/I A. Aguadero	11:00-11:25 I-4_5/I Fikile Brushett
11:25-11:50 I-1_6/I Dipan Kundu	11:25-11:45 I-2_18/O Byoungwoo Kang	11:25-11:45 I-3_22/O H. Yamada	11:25-11:50 I-4_20/I Xianfeng Li
11:50-12:10 I-1_7/O Lijun Fu	11:45-12:05 I-2_19/O Willy Porcher	11:45-12:05 I-3_23/O S. Taibl	11:50-12:10 I-4_7/O Andreas Münchinger
12:10-12:30 I-1_8/O Geoff McConohy	12:05-12:25 I-2_20/O M. Świętosławski	12:05-12:25 I-3_24/O B. Morgan	12:10-12:30 I-4_8/O Sergio Granados-Focil
	12:25-12:45 I-2_21/O Marcin Molenda	12:25-12:45 I-3_25/O F. Langer	
12:30-14:20 LUNCH	**12:45-14:20 LUNCH**	**12:45-14:20 LUNCH**	**12:25-14:20 LUNCH**
I-1/3	**I-2/6**	**I-3/7: SS Electrolyte session 1**	**I-4/3**
Chairpersons: Maximilian Fichtner, Corsin Battaglia	**Chairpersons: Teofilo Rojo, Cristina Tealdi**	**Chairpersons: Yang Shao Horn, Michal Struzik**	**Chairperson: Jusef Hassoun**
14:20-14:45 I-1_9/I Anji Reddy Munnangi	14:20-14:45 I-2_22/I E. Arroyo-de Dompablo	14:20-14:45 I-3_26/I D. Rettenwander	14:20-14:45 I-4_9/I Christina Roth
14:45-15:05 I-1_10/O Franziska Klein	14:45-15:05 I-2_23/O Kent Griffith	14:45-15:05 I-3_27/O T. Yamada	14:45-15:05 I-4_10/O Andrew Motz
15:05-15:25 I-1_11/O Zhonghui Cui	15:05-15:25 I-2_24/O Dragoljub Vrankovic	15:05-15:25 I-3_28/O K. Z. Fung	15:05-15:25 I-4_11/O Chuankun Jia
15:25-15:45 I-1_12/O Sevi Murugavel	15:25-15:45 I-2_25/O R. Shahbazian-Yassar	15:25-15:45 I-3_29/O P. R. Rayavarapu	15:25-15:45 I-4_12/O Lena Hoober-Burkhardt
		15:45-16:05 I-3_30/O A. Várez	
15:45-16:15 COFFEE BREAK	**15:45-16:15 COFFEE BREAK**	**16:05-16:15 COFFEE BREAK**	**15:45-16:15 COFFEE BREAK**
I-1/4	**I-2/7**	**I-3/8: SS Electrolyte session 2**	**I-4/4**
Chairpersons: Maximilian Fichtner, Corsin Battaglia	**Chairpersons: Saiful Islam, Craig Fisher**	**Chairpersons: Yang Shao Horn, Michal Struzik**	**Chairperson: Thomas Zawodzinski**
16:15-16:40 I-1_13/I Ilie Hanzu	16:15-16:40 I-2_26/I Clare Grey	16:20-16:45 I-3_31/I C. A. J. Fisher	16:15-16:40 I-4_13/I Gabriel Goenaga
16:40-17:00 I-1_14/O Lauren Marbella	16:40-17:00 I-2_27/O Markus Ding	16:45-17:05 I-3_32/O C. O'Rourke	16:40-17:05 I-4_14/I Tomoko Fujiwara
17:00-17:20 I-1_15/O Frédéric Blanc	17:00-17:20 I-2_28/O Bernard Lestriez	17:05-17:25 I-3_33/O L. Buannic	17:05-17:25 I-4_15/O Yun Li
17:20-17:40 I-1_16/O Léo Duchêne	17:20-17:40 I-2_29/O E. Yu. Evschik	17:25-17:45 I-3_34/O K. Hayashi	17:25-17:45 I-4_16/O Matteo Zago
	17:40-18:00 I-2_30/O Jun Yang	17:45-18:05 I-3_35/O B. Put	17:45-18:05 I-4_17/O Massimo Guarnieri
18:20 - 20:00	**POSTER Session S1**		

MONDAY 19th JUNE

I-7 – "POLYMER ELECTROLYTES" - THE UBIQUITY OF IONS AND POLYMER MATERIALS IN DEVICES	*I-8 – CERAMIC PROTON AND HYDRIDE ION CONDUCTORS*	*I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS*	*I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS*
Room: B9	**Room: A3**	**Room: A2**	**Room: B6**
	Chairperson: Hiroyuki Ohno		
08:00-08:45	**PLENARY – Udo Kragl**		
08:45-09:00 BREAK	**08:45-09:00 BREAK**	**08:45-09:00 BREAK**	**08:45-09:00 BREAK**
I-7/1	**I-8/1**	**I-9/4: Modelling Session II**	**I-10/1**
Chairperson: Yoichi Tominaga	**Chairpersons: Rotraut Merkle, Ragnar Strandbakke**	**Chairperson: Dane Morgan**	**Chairperson: Davide Barreca**
9:00-9:25 I-7_1/I Patrick Howlett	9:00-9:25 I-8_1/I Sossina Haile	9:00-9:25 I-9_15/I B. Boukamp	9:00-9:25 I-10_1/I G. Van Tendeloo
9:25-9:50 I-7_2/I Thomas Zawodzinski	9:25-9:45 I-8_2/O Ragnar Strandbakke	9:25-9:45 I-9_16/O A. Oz	9:25-9:45 I-10_2/O H. Yuan
9:50-10:15 I-7_3/I Michael Hickner	9:45-10:05 I-8_3/O Kwati Leonard	9:45-10:10 I-9_17/I J. W. Han	9:45-10:05 I-10_3/O M. Meffert
10:15-10:35 I-7_4/O Claudio Gerbaldi	10:05-10:25 I-8_4/O Reihaneh Zohourian	10:10-10:30 I-9_18/O A. McSloy	10:05-10:25 I-10_4/O T. Gries
	10:25-10:45 I-8_5/O Krzysztof Zagórski	10:30-10:50 I-9_19/O A. Nemudry	10:25-10:45 I-10_5/O A. Bieberle-Hütter
10:35-11:00 COFFEE BREAK	**10:45-11:00 COFFEE BREAK**	**10:50-11:00 COFFEE BREAK**	**10:45-11:00 COFFEE BREAK**
I-7/2	**I-8/2**	**I-9/5: SOFC Cathodes Session II**	**I-10/2**
Chairperson: Jelena Popovic	**Chairperson: Sandrine Ricote**	**Chairperson: Ellen Ivers-Tiffée**	**Chairperson: Juan Ramon Morante**
11:00-11:25 I-7_5/I Aswini Ghosh	11:00-11:25 I-8_6/I Y. Yamazaki	11:00-11:25 I-9_20/I Z.Shao	11:00-11:25 I-10_6/I J. Arbiol
11:25-11:50 I-7_6/I Rajendra Kumar Singh	11:25-11:45 I-8_7/O Glenn Mather	11:25-11:45 I-9_21/O M. Machala	11:25-11:45 I-10_7/O M. D'Arienzo
11:50-12:10 I-7_7/O Alexei Sokolov	11:45-12:05 I-8_8/O Takahisa Omata	11:45-12:05 I-9_22/O C. Chatzichristodoulou	11:45-12:05 I-10_8/O F. Pellegrino
12:10-12:30 I-7_8/O Falk Frenzel	12:05-12:25 I-8_9/O U. Anselmi-Tamburini	12:05-12:25 I-9_23/O Q. Ma	12:05-12:25 I-10_9/O L. Matoh
		12:25-12:45 I-9_24/O J. Wang	
12:30-14:20 LUNCH	**12:25-14:20 LUNCH**	**12:45-14:20 LUNCH**	**12:25-14:20 LUNCH**
I-7/3	**I-8/3**	**I-9/6: Characterization Session I**	**I-10/3**
Chairperson: Steve Greenbaum	**Chairperson: Min Chen**	**Chairperson: William Chueh**	**Chairperson: Renata Solarska**
14:20-14:45 I-7_9/I Manabu Tanaka	14:20-14:45 I-8_10/I Yeong-Cheol Kim	14:15-14:40 I-9_25/I S. McIntosh	14:20-14:45 I-10_10/I C. O'Dwyer
14:45-15:05 I-7_10/O Simranjit Singh	14:45-15:05 I-8_11/O Min Chen	14:40-15:00 I-9_26/O J. Wang	14:45-15:05 I-10_11/O R. Pelosato
15:05-15:25 I-7_11/O S. F. Mohamad Zamri	15:05-15:25 I-8_12/O William Bowman	15:00-15:20 I-9_27/O J. Kilner	15:05-15:25 I-10_12/O I. Metcalfe
15:25-15:45 I-7_12/O Maurizio Sansotera	15:25-15:45 I-8_13/O Vrindaa Somjiit	15:20-15:40 I-9_28/O G. Nurk	
		15:40-16:00 I-9_29/O C. Berger	
15:45-16:15 COFFEE BREAK	**15:45-16:15 COFFEE BREAK**	**16:00-16:15 COFFEE BREAK**	**15:25-16:15 COFFEE BREAK**
I-7/4	**I-8/4**	**I-9/7: SOFC Anodes Session II**	**I-10/4**
Chairperson: Patrick Howlett	**Chairpersons: Robert Kee, Jong-Sook Lee**	**Chairperson: Koichi Eguchi**	**Chairperson: Jordi Arbiol**
16:15-16:40 I-7_13/I S. Selvasekarapandian	16:15-16:40 I-8_14/I Gilles Taillades	16:15-16:40 I-9_30/I A. K. Opitz	16:15-16:35 I-10_13/O A. Guerrini
16:40-17:00 I-7_14/O Michele Braglia	16:40-17:00 I-8_15/O Domingo Pérez-Coll	16:40-17:00 I-9_32/O G. Man Choi	16:35-16:55 I-10_14/O M. Cobianchi
17:00-17:20 I-7_15/O Saverio Latorrata	17:00-17:20 I-8_16/O Jong-Sook Lee	17:00-17:20 I-9_33/O H. Zhao	16:55-17:15 I-10_15/O L. Rimoldi
17:20-17:40 I-7_16/O Asmae Mokrini	17:20-17:40 I-8_17/O Andreas Falkenstein	17:20-17:40 I-9_34/O D. Agarkov	17:15-17:35 I-10_16/O G. Martra
	17:40-18:00 I-8_18/O Sonia Escolástico	17:40-18:00 I-9_35/O M. Zheng	17:35-17:55 I-10_17/O S. McIntosh
		18:00-18:20 I-9_31/O A. Bertei	
18:20 - 20:00	**POSTER Session S1**		

MONDAY 19th JUNE

	I-12 – DEFECT CHEMISTRY, TRANSPORT AND REACTIVITY AT GAS/ELECTRODE INTERFACES			*I-14 – ELECTROCATALYSIS AT THE ELECTRODE-SOLID ELECTROLYTE INTERFACE*			*III-1 – IONICS MEETS BIOSCIENCE*			*IV-1 – MODELLING AND SIMULATION OF ION-CONDUCTING MATERIALS*		
	Room: B10			**Room: B4**			**Room: B8**			**Room: B5**		
							Chairperson: Hiroyuki Ohno					
08:00-08:45							**PLENARY – Udo Kragl**					
08:45-09:00			**BREAK**	**08:45-09:00**		**BREAK**	**08:45-09:00**		**BREAK**	**08:45-09:00**		**BREAK**
	I-12/1			**I-14/1**						**IV-1/1**		
	Chairperson: Bilge Yildiz			**Chairperson: Piotr Zelenay**						**Chairperson: Stephen Paddison**		
9:00-9:25	I-12_1/I		Jan Ingo Flege	9:00-9:30	I-14_1/K	A. Wilson				9:00-9:30	IV-1_1/K	Natalie Holzwarth
9:25-9:45	I-12_2/O		Siwon Lee	9:30-9:50	I-14_2/O	A. Wilson				9:30-9:55	IV-1_2/I	Stefano Mossa
9:45-10:05	I-12_3/O		Johanna Hackl	9:50-10:10	I-14_3/O	A. Levchenko				9:55-10:15	IV-1_3/O	Cornelia Cramer
10:05-10:25	I-12_4/O		Michele Riva	10:10-10:30	I-14_4/O	E. Stavrakakis				10:15-10:35	IV-1_4/O	Pooja Panchmatia
10:25-10:45	I-12_5/O		Yoonseok Choi									
10:45-11:00			**COFFEE BREAK**	**10:30-11:00**		**COFFEE BREAK**	**10:40-11:00**		**COFFEE BREAK**	**10:35-11:00**		**COFFEE BREAK**
	I-12/2			**I-14/2**						**IV-1/2**		
	Chairperson: Jan Ingo Flege			**Chairperson: Sanjeev Mukerjee**						**Chairperson: Yue Qi**		
11:00-11:25	I-12_6/I		Tatsumi Ishihara	11:00-11:25	I-14_5/I	M. Koper				11:00-11:20	IV-1_5/O	Stephan P. Waldow
11:25-11:45	I-12_7/O		Yang Liu	11:25-11:45	I-14_7/O	U. Anjum				11:20-11:40	IV-1_6/O	Taner Akbay
11:45-12:05	I-12_8/O		Corinne Salles							11:40-12:00	IV-1_7/O	Junichi Kawamura
12:05-12:25	I-12_9/O		Yoshiaki Hayamizu							12:00-12:20	IV-1_8/O	Natalia Skorodumova
12:25-14:20			**LUNCH**	**11:45-14:20**		**LUNCH**	**12:20-14:20**		**LUNCH**	**12:20-14:20**		**LUNCH**
	I-12/3			**I-14/3**			**III-1/1**			**IV-1/3**		
	Chairperson: Tatsumi Ishihara			**Chairperson: Deborah Myers**			**Chairperson: Kyoko Fujita**			**Chairperson: Stefano Mossa**		
14:20-14:40	I-12_10/O		Vladislav Sadykov	14:20-14:45	I-14_8/I	K. More	14:20-14:45	III-1_1/I	H. Ohno	14:20-14:50	IV-1_9/K	Karl-Michael Weitzel
14:40-15:00	I-12_11/O		Isao Kagomiya	14:45-15:10	I-14_9/I	M. Chatenet	14:45-15:10	III-1_2/I	C. Pereira	14:50-15:20	IV-1_10/K	Michele Pavone
15:00-15:20	I-12_12/O		Kun Zheng	15:10-15:30	I-14_10/O	T. Kraia	15:10-15:30	III-1_3/O	H. Ohno	15:20-15:40	IV-1_11/O	Kun Zheng
15:20-15:40	I-12_13/O		Aleksey Yaremchenko	15:30-15:50	I-14_11/O	J. Rongé	15:30-15:50	III-1_4/O	K. Takahashi	15:40-16:00	IV-1_12/O	Steffen Grieshammer
15:40-16:15			**COFFEE BREAK**	**15:50-16:15**		**COFFEE BREAK**	**15:50-16:15**		**COFFEE BREAK**	**16:00-16:15**		**COFFEE BREAK**
	I-12/4			**I-14/4**			**III-1/2**			**IV-1/4**		
	Chairperson: Michele Riva			**Chairperson: Makoto Uchida**			**Chairperson: Kenji Takahashi**			**Chairperson: Michele Pavone**		
16:15-16:35	I-12_14/O		E. Ruiz-Trejo	16:15-16:40	I-14_12/I	H. Imai	16:15-16:40	III-1_5/I	K. Fujita	16:20-16:40	IV-1_13/O	Pjotrs Žguns
16:35-16:55	I-12_15/O		Young-il Kwon	16:40-17:05	I-14_13/I	Y. Seung Kim	16:40-17:05	III-1_6/I	J. Hallett	~~16:40-17:00~~	~~IV-1_14/O~~	~~Kazuaki Toyoura~~
16:55-17:15	I-12_16/O		Beom Tak Na	17:05-17:25	I-14_14/O	P. Atanassov	17:05-17:30	III-1_7/I	M. Morikawa	17:00-17:20	IV-1_15/O	Mohammed B. Effat
17:15-17:35	I-12_17/O		M. Popov	17:25-17:45	I-14_15/O	M. Alpuche-Aviles	17:30-17:50	III-1_8/O	J.-Y. Sun	17:20-17:40	IV-1_16/O	Aleksei Krasnov
17:35-17:55	I-12_18/O		Wolfgang Preis				17:50-18:10	III-1_9/O	K. Sombatmankhong	17:40-18:00	IV-1_17/O	S. Sankaranarayanan
18:20 - 20:00							**POSTER Session S1**					

MONDAY 19th JUNE

	IV-2– ADVANCES IN HIGH SPATIAL RESOLUTION PROBING OF LOCAL HETEROGENEITIES IN ION-CONDUCTING MATERIALS		*IV-5 – TRANSPORT IN MORPHOLOGICALLY HETEROGENEOUS POROUS MEDIA: ADVANCING CHARACTERIZATION FROM IN-SITU TO IN-OPERANDO*		*IV-6 – SYNCHROTRON AND NEUTRON TECHNIQUES FOR THE STUDY OF ION-CONDUCTING MATERIALS*	
	Room: A4		**Room: A5**		**Room: A6**	
			Chairperson: Hiroyuki Ohno			
08:00-08:45			**PLENARY – Udo Kragl**			
08:45-09:00		**BREAK**	**08:45-09:00**	**BREAK**	**08:45-09:00**	**BREAK**
	IV-2/1		**IV-5/1**		**IV-6/1: Operando Battery Session 1**	
	Chairpersons: Peter Crozier, David McComb		**Chairperson: Iryna Zenyuk**		**Chairperson: Sandrine Lyonnard**	
9:00-9:25	IV-2_1/I	John Kilner	9:00-9:30 IV-5_1/K	J. Eller	9:00-9:30 IV-6_1/K	Michael F. Toney
9:25-9:50	IV-2_2/I	Yuichi Ikuhara	9:30-9:55 IV-5_2/I	A. Bazylak	9:30-9:55 IV-6_2/I	Samuel Tardif
9:50-10:10	IV-2_3/O	Karl-Michael Weitzel	9:55-10:20 IV-5_3/I	M. Secanell	9:55-10:20 IV-6_3/I	Giuliana Aquilanti
10:10-10:30	IV-2_4/O	William Bowman	10:20-10:40 IV-5_4/O	I. Zenyuk	10:20-10:40 IV-6_4/O	Kent Griffith
10:30-11:00		**COFFEE BREAK**	**10:40-11:00**	**COFFEE BREAK**	**10:40-11:00**	**COFFEE BREAK**
	IV-2/2		**IV-5/2**		**IV-6/2: Operando Battery Session 2**	
	Chairpersons: Y. Shirley Meng, M. Stanley Whittingham		**Chairperson: Radenka Maric**		**Chairperson: Sandrine Lyonnard**	
11:00-11:25	IV-2_5/I	Shyue Ping Ong	11:00-11:25 IV-5_5/I	R. Borup	11:00-11:25 IV-6_5/I	Claire Villevieille
11:25-11:45	IV-2_7/O	Hans-Georg Steinrück	11:25-11:45 IV-5_6/O	A. Bisello	11:25-11:50 IV-6_6/I	Vedran Vonk
11:45-12:05	IV-2_8/O	Aaron Mascaro	11:45-12:05 IV-5_7/O	A. Oz	11:50-12:10 IV-6_7/O	Coraline Millot
12:05-12:25	IV-2_9/O	Eriko Watanabe	12:05-12:25 IV-5_8/O	S. Deabate	12:10-12:35 IV-6_8/I	Matteo Bianchini
12:25-14:20		**LUNCH**	**12:25-14:20**	**LUNCH**	**12:35-14:20**	**LUNCH**
	IV-2/3		**IV-5/3**		**IV-6/3: Dynamics Session 1**	
	Chairpersons: Peter Crozier, David McComb		**Chairperson: Adam Weber**		**Chairperson: Alexei Sokolov**	
14:20-14:45	IV-2_10/I	Shirley Meng	14:20-14:45 IV-5_9/I	K. Karan	14:20-14:45 IV-6_9/I	Didier Blanchard
14:45-15:10	IV-2_11/I	Paul Shearing	14:45-15:10 IV-5_10/I	A. Weber	14:45-15:10 IV-6_10/I	Sergei Danilkin
15:10-15:30	IV-2_12/O	Susana García-Martín	15:10-15:30 IV-5_11/O	R. Maric	15:10-15:30 IV-6_11/O	Joseph Peet
15:30-15:50	IV-2_13/O	Roland Bliem	15:30-15:50 IV-5_12/O	M. Ananyev	15:30-15:50 IV-6_12/O	Laura Mazzei
15:50-16:15		**COFFEE BREAK**	**15:50-16:15**	**COFFEE BREAK**	**15:50-16:15**	**COFFEE BREAK**
	IV-2/4		**IV-5/4**		**IV-6/4: Dynamics Session 2**	
	Chairpersons: Y. Shirley Meng, M. Stanley Whittingham		**Chairperson: Svitlana Pylypenko**		**Chairperson: Alexei Sokolov**	
16:15-16:40	IV-2_15/I	Scott Barnett	16:15-16:35 IV-5_13/O	S. Jeon	16:15-16:40 IV-6_13/I	Maths Karlsson
16:40-17:05	IV-2_16/I	David W. McComb	16:35-16:55 IV-5_14/O	H. Matsui	16:40-17:00 IV-6_14/O	Chris D. Ling
17:05-17:25	IV-2_17/O	William Bowman	16:55-17:15 IV-5_15/O	S. Burkhardt	17:00-17:20 IV-6_15/O	A. Piovano
17:25-17:45	IV-2_18/O	David Mebane	17:15-17:35 IV-5_16/O	S. Pylypenko	17:20-17:40 IV-6_16/O	Fanni Juranyi
15:45-16:05	IV-2_14/O	Daniel Marinha	17:35-17:55 IV-5_17/O	N. R. Sattineni		
			17:55-18:20 IV-5_18/I	D. Myers		
18:20 - 20:00			**POSTER Session S1**			

TUESDAY 20th JUNE

	I-1 – BEYOND LITHIUM BATTERIES: IONIC TRANSPORT IN POST-LI SYSTEMS			*I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS*			*I-3 – ALL SOLID-STATE BATTERIES*			*I-7 – "POLYMER ELECTROLYTES" - THE UBIQUITY OF IONS AND POLYMER MATERIALS IN DEVICES*		
	Room: B2			**Room: B7**			**Room: B1**			**Room: B9**		
08:00-08:45	**PLENARY – Masakazu Aono**			**PLENARY – Masakazu Aono**			**PLENARY – Masakazu Aono**			**PLENARY – Masakazu Aono**		
08:45-09:00	**BREAK**			**BREAK**			**BREAK**			**BREAK**		
	I-1/5			**1-2/8**			**1-3/9: Battery session 1**			**I-7/5**		
	Chairpersons: Maximilian Fichtner, Corsin Battaglia			**Chairpersons: Doron Aurbach, Craig Fisher**			**Chairpersons: Carl Thompson, Yasutoshi Irayama**			**Chairperson: Jean-Yves Sanchez**		
				9:00-9:30	I-2_31/K	Doron Aurbach	9:00-9:25	I-3_36/I	Eric D. Wachsman	9:00-9:30	I-7_17/K	Cristina Iojoiu
9:00-9:25	I-1_17/I	Kostiantyn Kravchyk		9:30-9:50	I-2_32/O	Valerie Pralong	9:25-9:45	I-3_37/O	James Trevey	9:30-9:55	I-7_18/I	Michael Zimmerman
9:25-9:50	I-1_18/I	Yair Ein-Eli		9:50-10:10	I-2_33/O	Edouard Boivin	9:45-10:05	I-3_38/O	Arndt Remhof	9:55-10:20	I-7_19/I	Maria Assunta Navarra
9:50-10:15	I-1_19/I	Tina Nestler		10:10-10:30	I-2_34/O	Yiyang Li	10:05-10:25	I-3_39/O	Andreas Mertens	10:20-10:40	I-7_20/O	Gioele Pagot
10:15-10:35	I-1_20/O	Enkhtsetseg Dashjav					10:25-10:45	I-3_40/O	Giovanna Bucci			
10:35-11:00	**COFFEE BREAK**			**10:30-11:00**	**COFFEE BREAK**		**10:45-11:00**	**COFFEE BREAK**		**10:40-11:00**	**COFFEE BREAK**	
	I-1/6			**1-2/9**			**1-3/10: Battery session 2**			**I-7/6**		
	Chairpersons: Maximilian Fichtner, Corsin Battaglia			**Chairpersons: Doron Aurbach, Stefano Passerini**			**Chairpersons: Carl Thompson, Yasutoshi Irayama**			**Chairperson: Michael Hickner**		
				11:00-11:25	I-2_35/I	M. Wohlfahrt-Mehrens	11:00-11:25	I-3_41/I	Michal Struzik	11:00-11:25	I-7_21/I	Nitash Balsara
~~11:00-11:25~~	~~I-1_21/I~~	~~Fausto Croce~~		11:25-11:45	I-2_36/O	William Gent	11:25-11:45	I-3_42/O	Kazuo Yamamoto	11:25-11:50	I-7_22/I	Bernard Lestriez
11:25-11:50	I-1_22/I	J. Hassoun		11:45-12:05	I-2_37/O	T. Yamada	11:45-12:05	I-3_43/O	Jochen Joos	11:50-12:10	I-7_23/O	Kento Kimura
11:50-12:10	I-1_23/O	M. Safrany Renard		12:05-12:25	I-2_38/O	Yair Ein-Eli	12:05-12:25	I-3_44/O	R. Kumar Singh	12:10-12:30	I-7_25/O	Nahid Iranipour
12:10-12:30	I-1_24/O	Atsushi Sakuda		12:25-12:45	I-2_39/O	Masatsugu Oishi	12:25-12:45	I-3_45/O	Reto Pfenninger			
12:30-12:50	I-1_25/O	Minoru Umeda										
12:50-14:20	**LUNCH**			**12:45-14:20**	**LUNCH**		**12:45-14:20**	**LUNCH**		**12:30-14:20**	**LUNCH**	
				1-2/10			**1-3/11: Battery session 3**			**I-7/7**		
				Chairpersons: Elena Arroyo-de Dompablo, Cristina Tealdi			**Chairpersons: Jürgen Janek, Martin Wilkening**			**Chairperson: Monika Schönhoff**		
							14:15-14:40	I-3_46/I	Yoon Seok Jung	14:20-14:45	I-7_26/I	Takahiro Ichikawa
				14:20-14:45	I-2_40/I	Christian Masquelier	14:40-15:00	I-3_47/O	Iñigo Garbayo	14:45-15:05	I-7_27/O	Pierluigi Cossari
				14:45-15:05	I-2_41/O	Shyue Ping Ong	15:00-15:20	I-3_48/O	Rafael Trócoli	15:05-15:25	I-7_28/O	Scott Lewis
				15:05-15:25	I-2_42/O	James Dawson	15:20-15:40	I-3_49/O	Aik Jun Tan	15:25-15:45	I-7_29/O	S. Selvasekarapandian
				15:25-15:45	I-2_43/O	Mehmet Ali Gulgun	15:40-16:00	I-3_50/O	Kazunori Takada			
15:55-16:15	**COFFEE BREAK**			**15:45-16:15**	**COFFEE BREAK**		**16:00-16:20**	**COFFEE BREAK**		**15:45-16:15**	**COFFEE BREAK**	
				1-2/11			**1-3/12: Battery session 4**			**I-7/8**		
				Chairpersons: Shyue Ping Ong, Cristina Tealdi			**Chairpersons: Jürgen Janek, Martin Wilkening**			**Chairperson: Cristina Iojoiu**		
				16:15-16:40	I-2_44/I	Atsuo Yamada	16:20-16:45	I-3_51/I	Carl V. Thompson	16:15-16:40	I-7_30/I	Nobuko Yoshimoto
				16:40-17:00	I-2_45/O	Frédéric Blanc	16:45-17:05	I-3_52/O	Koichi Hamamoto	~~16:40-17:00~~	~~I-7_31/O~~	~~Sabina Abbrent~~
				17:00-17:20	I-2_46/O	Guillaume Lefèvre	17:05-17:25	I-3_53/O	Norikazu Ishigaki	17:00-17:20	I-7_32/O	Marc Brinkkötter
				17:20-17:40	I-2_47/O	James Trevey	17:25-17:45	I-3_54/O	Francesco Pagani	17:20-17:40	I-7_33/O	Louis Madsen
				17:40-18:05	I-2_79/I	Evgeny V. Antipov	17:45-18:05	I-3_55/O	Reto Pfenninger	17:40-18:00	I-7_34/O	M. Yoshizawa-Fujita
18:20-20:00	**PRESENTATION OF YOUNG SCIENTIST & MID CAREER AWARDS**											

TUESDAY 20th JUNE

I-8 – CERAMIC PROTON AND HYDRIDE ION CONDUCTORS			*I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS*			*I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS*			*I-11 – FUNCTIONAL METAL OXIDE INTERFACES IN EFFICIENT ELECTROCHEMICAL ENERGY CONVERSION, BIOMASS CONVERSION AND CHARGE STORAGE SYSTEMS*		
Room: A3			**Room: A2**			**Room: B6**			**Room: B4**		
08:00-08:45	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**	
08:45-09:00	**BREAK**		**08:45-09:00**	**BREAK**		**08:45-09:00**	**BREAK**		**08:45-09:00**	**BREAK**	
I-8/5			**I-9/8: SOFC Cathodes III - Ruddlesden-Popper-Phases**			**I-10/5**					
Chairpersons: Marie-Laure Fontaine, Glenn Mather			**Chairperson: Rose-Noëlle Vannier**			**Chairperson: Johan Ten Elshof**					
9:00-9:25	I-8_19/I	Marie-Laure Fontaine	9:00-9:25	I-9_36/I	J.-M. Bassat	9:00-9:25	I-10_18/I	Y. Lei			
9:25-9:45	I-8_20/O	Neal Sullivan	9:25-9:45	I-9_37/O	M. Yatoo	9:25-9:45	I-10_19/O	J.Ramon Morante			
9:45-10:05	I-8_21/O	Jose Manuel Serra	9:45-10:05	I-9_38/O	C. Nicollet	9:45-10:05	I-10_20/O	Yu Xu			
10:05-10:25	I-8_22/O	Daniel Clark	10:05-10:25	I-9_39/O	J. C. Grenier	10:05-10:25	I-10_21/O	Yuqi Lyu			
10:25-10:45	I-8_23/O	Robert J. Kee	10:25-10:45	I-9_40/O	G. Gauthier	10:25-10:45	I-10_22/O	R. Carcione			
10:45-11:00	**COFFEE BREAK**		**10:45-11:00**	**COFFEE BREAK**		**10:45-11:00**	**COFFEE BREAK**		**10:40-11:00**	**COFFEE BREAK**	
I-8/6			**I-9/9: SOFC Cathodes IV - Stability Issues**			**I-10/6**					
Chairperson: Truls Norby			**Chairperson: Stephen Skinner**			**Chairperson: Leonhard Mayrhofer**					
11:00-11:25	I-8_24/I	John Irvine	11:00-11:25	I-9_41/I	A. Egger	11:00-11:25	I-10_23/I	R. Solarska			
11:25-11:45	I-8_25/O	Erik Jedvik Granhed	11:25-11:45	I-9_42/O	R. A. Budiman	11:25-11:45	I-10_24/O	K. Frohlich			
11:45-12:05	I-8_26/O	Itaru Oikawa	11:45-12:05	I-9_43/O	Na Ni	11:45-12:05	I-10_25/O	T. Andreu			
12:05-12:25	I-8_27/O	Vladislav Sadykov	12:05-12:25	I-9_44/O	N. Menzler	12:05-12:25	I-10_26/O	I. Povey			
12:25-12:45	I-8_28/O	Takahisa Omata	12:25-12:45	I-9_45/O	E. Bucher						
12:45-14:20	**LUNCH**		**12:45-14:20**	**LUNCH**		**12:25-14:20**	**LUNCH**		**12:20-14:20**	**LUNCH**	
I-8/7			**I-9/10: Characterization II**			**I-10/7**					
Chairpersons: John Irvine, Genki Kobayashi			**Chairperson: John Kilner**			**Chairperson: Colm O'Dwyer**					
14:20-14:45	I-8_29/I	Genki Kobayashi	14:10-14:35	I-9_46/I	M. Dunstan	14:20-14:45	I-10_27/I	L. McElwee-White			
14:45-15:05	I-8_30/O	Keiga Fukui	14:35-15:00	I-9_47/I	C. Xia	14:45-15:05	I-10_28/O	S. Mascotto			
15:05-15:25	I-8_31/O	Yoshitaka Aoki	15:00-15:20	I-9_48/O	R. Sažinas	15:05-15:25	I-10_29/O	N. Eremeev			
15:25-15:45	I-8_32/O	Jong-Ho Lee	15:20-15:40	I-9_49/O	A. Taracón	15:25-15:45	I-10_30/O	G. Beach			
			15:40-16:00	I-9_50/O	A.V. Shlyakhtina						
15:45-16:15	**COFFEE BREAK**		**16:00-16:15**	**COFFEE BREAK**		**15:45-16:15**	**COFFEE BREAK**		**15:55-16:15**	**COFFEE BREAK**	
I-8/8			**I-9/11: Electrolytes I**			**I-10/8**			**I-11/1**		
Chairpersons: José M. Serra, Laura Rioja-Monllor			**Chairperson: Tatsumi Ishihara**			**Chairperson: Teresa Andreu**			**Chairpersons: Pawel Kulesza, John Errington, Nicolas Alonso-Vante**		
16:15-16:40	I-8_33/I	Guilhem Dezanneu	16:15-16:40	I-9_51/I	T. Norby	16:15-16:35	I-10_31/O	J. Garbarczyk	16:15-16:40	I-11_1/I	C. Janáky
16:40-17:00	I-8_34/O	Carlos Bernuy-Lopez	16:40-17:00	I-9_52/O	T. Sakai	16:35-16:55	I-10_32/O	C. Cara	16:40-17:05	I-11_2/I	N. Alonso-Vante
17:00-17:20	I-8_35/O	Reginaldo Muccillo	17:00-17:20	I-9_53/O	D. (P. C.) Shih	16:55-17:15	I-10_33/O	M. Amin Farkhondehfal	17:05-17:30	I-11_3/I	E. Lust
17:20-17:40	I-8_36/O	Laura Rioja-Monllor	17:20-17:40	I-9_54/O	S. Ricote	17:15-17:35	I-10_34/O	M. Biset	17:30-17:55	I-11_4/I	Ira A. Weinstock
17:40-18:00	I-8_37/O	Cecilia Mortalò	17:40-18:00	I-9_55/O	E. Yu. Konysheva	17:35-17:55	I-10_35/O	M. Pica	17:55-18:15	I-11_5/O	P. J. Kulesza
			18:00-18:20	I-9_56/O	M. Viviani						
18:20-20:00	**PRESENTATION OF YOUNG SCIENTIST & MID CAREER AWARDS**										

TUESDAY 20th JUNE

I-12 – DEFECT CHEMISTRY, TRANSPORT AND REACTIVITY AT GAS/ELECTRODE INTERFACES			*I-13 – ELECTRO-CHEMO-MECHANICAL COUPLING IN ENERGY STORAGE AND CONVERSION MATERIALS*			*I-14 – ELECTROCATALYSIS AT THE ELECTRODE-SOLID ELECTROLYTE INTERFACE*			*I-15 – PHOTOCHEMICAL AND PHOTOCATALYTIC ENERGY CONVERSION*		
Room: B10			**Room: A5**			**Room: B4**			**Room: A7**		
08:00-08:45	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**	
08:45-09:00	**BREAK**		**08:45-09:00**	**BREAK**		**08:45-09:00**	**BREAK**		**08:45-09:00**	**BREAK**	
	I-12/5			**I-13/1: Strain & Transport**			**I-14/5**			**I-15/1**	
	Chairperson: Koichi Eguchi			**Chairperson: Nicola Perry**			**Chairperson: Keith Stevenson**			**Chairperson: Ian Sharp**	
9:00-9:25	I-12_19/I	Peter Crozier	9:00-9:25	I-13_1/I	Ho Nyung Lee	9:00-9:25	I-14_16/I	M. Watanabe	9:00-9:30	I-15_1/K	Guido Saracco
9:25-9:45	I-12_20/O	M. Christoph Doppler	9:25-9:50	I-13_2/I	Tetsu Ichitsubo	9:25-9:50	I-14_17/I	D. Banham	9:30-10:00	I-15_2/K	Shane Ardo
9:45-10:05	I-12_21/O	Bugra Kayaalp	9:50-10:10	I-13_3/O	Dane Morgan	9:50-10:10	I-14_18/O	F. Tasca	10:00-10:20	I-15_3/O	Madhur Boloor
10:05-10:25	I-12_22/O	Yingjing Zheng	10:10-10:30	I-13_4/O	Wakako Araki				10:20-10:40	I-15_4/O	Raman Vedarajan
10:25-10:45	I-12_23/O	Keita Mizuno									
10:45-11:00	**COFFEE BREAK**		**10:30-11:00**	**COFFEE BREAK**		**10:10-11:00**	**COFFEE BREAK**		**10:40-11:00**	**COFFEE BREAK**	
	I-12/6			**I-13/2: Stress & Defect Chemistry**			**I-14/6**			**I-15/2**	
	Chairperson: Peter Crozier			**Chairperson: Koji Amezawa**			**Chairperson: Plamen Atanassov**			**Chairperson: Shane Ardo**	
11:00-11:25	I-12_24/I	Koichi Eguchi	11:00-11:20	I-13_5/O	Igor Lubomirsky	11:00-11:25	I-14_19/I	K. Stevenson	11:00-11:30	I-15_5/K	Raffaella Buonsanti
11:25-11:45	I-12_25/O	Dongha Kim	11:20-11:40	I-13_6/O	Hitoshi Takamura	11:25-11:50	I-14_20/I	S. Mukerjee	11:30-12:00	I-15_6/K	Gordana Dukovic
11:45-12:05	I-12_26/O	Aleksey Yaremchenko	11:40-12:00	I-13_7/O	Yuta Kimura	11:50-12:10	I-14_21/O	R. Elgammal	12:00-12:20	I-15_7/O	Mario Alpuche-Aviles
12:05-12:25	I-12_27/O	Celeste van den Bosch	12:00-12:20	I-13_8/O	Bilge Yildiz				12:20-12:40	I-15_8/O	Peter Crozier
			12:20-12:40	I-13_9/O	Kiran Adepalli						
12:25-14:20	**LUNCH**		**12:40-14:20**	**LUNCH**		**12:10-14:20**	**LUNCH**		**12:40-14:20**	**LUNCH**	
	I-12/7			**I-13/3: Materials Chemistry by Design**			**I-14/7**			**I-15/3**	
	Chairperson: Dane Morgan			**Chairperson: Eric Wachsmann**			**Chairperson: Pawel Kulesza**			**Chairperson: Holger Dau**	
14:20-14:40	I-12_28/O	Han Gil Seo	14:20-14:45	I-13_10/I	Nicole Benedek	14:20-14:45	I-14_22/I	M. Uchida	14:20-14:50	I-15_9/K	Laia Francàs
14:40-15:00	I-12_29/O	M. Paola Carpanese	14:45-15:10	I-13_11/I	Andrey Zuev	14:45-15:05	I-14_23/O	P. J. Kulesza	14:50-15:20	I-15_10/K	Marco Favaro
15:00-15:20	I-12_30/O	K. Develos-Bagarinao	15:10-15:30	I-13_12/O	Mehdi Pishahang	15:05-15:25	I-14_24/O	E. Negro	15:20-15:50	I-15_11/K	Dino Klotz
15:20-15:40	I-12_31/O	Emi Takahashi	15:30-15:50	I-13_13/O	Meike V. F. Heinz						
15:40-16:15	**COFFEE BREAK**		**15:50-16:15**	**COFFEE BREAK**		**15:25-16:15**	**COFFEE BREAK**		**15:50-16:15**	**COFFEE BREAK**	
	I-12/8			**I-13/4: Analysis/Technique Development**						**I-15/4**	
	Chairperson: Jong Hoon Joo			**Chairperson: Krystyn Van Vliet**						**Chairperson: Gordana Dukovic**	
16:15-16:35	I-12_32/O	Dane Morgan	16:15-16:40	I-13_14/I	Jose Santiso				16:15-16:45	I-15_12/K	Yanbo Li
16:35-16:55	I-12_33/O	Ana Belén Muñoz-García	16:40-17:05	I-13_15/I	Jason Nicholas				16:45-17:15	I-15_13/K	Andrea Sartorel
16:55-17:15	I-12_34/O	Zixuan Guan	17:05-17:30	I-13_16/I	Mayu Muramatsu				17:15-17:45	I-15_14/K	Joel Haber
17:15-17:35	I-12_35/O	Tatsuya Kawada	17:30-17:50	I-13_17/O	Holger Fritze				17:45-18:05	I-15_15/O	Shu Yamaguchi
			17:50-18:10	I-13_18/O	Y. Tsur						
18:20-20:00	**PRESENTATION OF YOUNG SCIENTIST & MID CAREER AWARDS**										

TUESDAY 20th JUNE

II-2 – REALIZATION OF NEW FUNCTIONAL OPTOELECTRONIC OXIDE BASED MATERIALS: EXPERIMENT AND THEORY			*II-3 – THE SCIENCE AND TECHNOLOGY OF 2D MATERIALS*			*II-4 – IONICS OF MEMRISTOR /RESISTIVE SWITCHES*			*III-2 – ION CONDUCTING MEMBRANES FOR BIOELECTROCHEMICAL APPLICATIONS*		
Room: B2			**Room: M3**			**Room: B3**			**Room: B8**		
08:00-08:45	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**	
08:45-09:00	**BREAK**		**08:45-09:00**	**BREAK**		**08:45-09:00**	**BREAK**		**08:45-09:00**	**BREAK**	
						II-4/1			**III-2/1**		
						Chairperson: Shu Yamaguchi			**Chairperson: Plamen Atanassov**		
						9:00-9:30	II-4_1/K	L. Chua	9:00-9:30	III-2_1/K	Elena E. Ferapontova
						9:30-9:55	II-4_2/I	T. Hasegawa	9:30-9:55	III-2_2/I	Riccarda Antiochia
						9:55-10:20	II-4_3/I	M. Skowronski	9:55-10:20	III-2_3/I	Lo Gorton
						10:20-10:40	II-4_4/O	I. Valov	10:20-10:40	III-2_4/O	Carlo Santoro
10:40-11:00	**COFFEE BREAK**		**10:40-11:00**	**COFFEE BREAK**		**10:40-11:00**	**COFFEE BREAK**		**10:40-11:00**	**COFFEE BREAK**	
						II-4/2			**III-2/2**		
						Chairperson: Shu Yamaguchi			**Chairperson: Pierangela Cristiani**		
						11:00-11:25	II-4_5/I	C. S. Hwang	11:00-11:30	III-2_5/K	Tom Sleutels
						11:25-11:50	II-4_10/I	Y. Aoki	11:30-11:55	III-2_6/I	Benjamin Erable
						11:50-12:10	II-4_7/O	S. Menze	11:55-12:15	III-2_7/O	Stefania Marzorati
						12:10-12:30	II-4_8/O	M. Martin	12:15-12:35	III-2_8/O	Barbara Mecheri
12:20-14:20	**LUNCH**		**12:20-14:20**	**LUNCH**		**12:30-14:20**	**LUNCH**		**12:35-14:20**	**LUNCH**	
II-2/1						**II-4/3**			**III-2/3**		
Chairperson: David Ginley						**Chairperson: Ilia Valov**			**Chairperson: Carlo Santoro**		
14:20-14:45	II-2_1/I	Yuzo Shigesato				14:20-14:45	II-4_9/I	S. Watanabe	14:20-14:45	III-2_9/I	Enrico Marsili
14:45-15:10	II-2_2/I	Holger von Wenckstern				14:45-15:10	II-4_6/I	T. Tsuchiya	14:45-15:10	III-2_10/I	Pierangela Cristiani
15:10-15:30	II-2_3/O	Marina Muñoz Castro				15:10-15:30	II-4_11/O	J.L.M. Rupp	15:10-15:30	III-2_11/O	Shelley Minteer
15:30-15:50	II-2_4/O	Paul Erhart				15:30-15:50	II-4_12/O	A. Nenning	15:30-15:50	III-2_12/O	Plamen Atanassov
15:50-16:15	**COFFEE BREAK**		**15:55-16:15**	**COFFEE BREAK**		**15:50-16:15**	**COFFEE BREAK**		**15:50-16:15**	**COFFEE BREAK**	
II-2/2			**II-3/1**			**II-4/4**			**III-2/4**		
Chairperson: David Ginley			**Chairperson: Francesco Bonaccorso**			**Chairperson: Ilia Valov**			**Chairperson: Shelley Minteer**		
16:15-16:40	II-2_5/I	Lingyan Liang	16:15-16:45	II-3_1/K	Luigi Colombo	16:15-16:40	II-4_13/I	H.-I. Yoo	~~16:15-16:40~~	~~III-2_13/I~~	~~Nurit Ashkenasy~~
16:40-17:00	II-2_6/O	Gamze Atak	16:45-17:10	II-3_2/I	Hyungjun Kim	16:40-17:00	II-4_14/O	P. Hein	16:40-17:00	III-2_14/O	Simone Angioni
17:00-17:20	II-2_7/O	Alberto Doria	17:10-17:35	II-3_3/I	Alain Penicaud	17:00-17:20	II-4_15/O	H. Yildrim	17:00-17:20	III-2_15/O	Fabien Giroud
			17:35-17:55	II-3_4/O	Giuseppe V. Bianco	17:20-17:40	II-4_16/O	E. Sediva	17:20-17:40	III-2_16/O	Yasumitsu Matsuo
			17:55-18:15	II-3_5/O	Stiven Forti						
			18:15-18:35	II-3_6/O	Virginia Carnevali						
18:20-20:00	**PRESENTATION OF YOUNG SCIENTIST & MID CAREER AWARDS**										

TUESDAY 20th JUNE

IV-1 – MODELING AND SIMULATION OF ION-CONDUCTING MATERIALS			*IV-3 - INTERFACIAL PROCESSES AND NANOIONICS*			*IV-4 - POINT DEFECT CHEMISTRY OF OXIDE MATERIALS*			*IV-6 SYNCHROTRON AND NEUTRON TECHNIQUES FOR THE STUDY OF ION-CONDUCTING MATERIALS*		
Room: B5			**Room: B5**			**Room: A4**			**Room: A6**		
08:00-08:45	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**		**08:00-08:45**	**PLENARY – Masakazu Aono**	
08:45-09:00	**BREAK**		**08:45-09:00**	**BREAK**		**08:45-09:00**	**BREAK**		**08:45-09:00**	**BREAK**	
IV-1/5									**IV-6/5: Polymers Structure**		
Chairperson: Stephen Paddison									**Chairperson: Sandrine Lyonnard**		
9:00-9:30	IV-1_18/K	Oleg Borodin							9:00-9:30	IV-6_17/K	Ahmet Kusoglu
9:30-9:55	IV-1_19/I	Yue Qi							9:30-9:55	IV-6_18/I	Gerard Gebel
9:55-10:15	IV-1_20/O	Yusuke Noda							9:55-10:20	IV-6_19/I	Aurel Radulescu
10:15-10:35	IV-1_21/O	Austin Sendek									
10:35-11:00	**COFFEE BREAK**		**10:40-11:00**	**COFFEE BREAK**		**10:40-11:00**	**COFFEE BREAK**		**10:20-11:00**	**COFFEE BREAK**	
IV-1/6									**IV-6/6: Polymers Structure**		
Chairperson: Oleg Borodin									**Chairperson: Sandrine Lyonnard**		
11:00-11:30	IV-1_22/K	Mark Tuckerman							11:00-11:25	IV-6_20/I	Robert Moore
11:30-11:50	IV-1_23/O	Stephen Paddison							11:25-11:50	IV-6_21/I	Giuseppe Portale
11:50-12:10	IV-1_24/O	Karl-Michael Weitzel							11:50-12:10	IV-6_22/O	Joseph A. Dura
12:10-12:30	IV-1_25/O	Takeshi Usuki									
12:30-14:20	**LUNCH**		**12:20-14:20**	**LUNCH**		**12:20-14:20**	**LUNCH**		**12:10-14:20**	**LUNCH**	
			IV-3/1			**IV-4/1**			**IV-6/7: Oxides Structure**		
			Chairperson: Joachim Maier			**Chairpersons: Vladan Stevanovic, Tanmoy Paul**			**Chairperson: Gerard Gebel**		
			14:20-14:50	IV-3_1/K	U. Diebold	14:20-14:45	IV-4_1/I	Henny J.M. Bouwmeester	14:20-14:45	IV-6_23/I	Evvy Kartini
			14:50-15:15	IV-3_2/I	C. Jooss	14:45-15:05	IV-4_2/O	Ute Nikola Gries	14:45-15:05	IV-6_24/O	Cristina Artini
			15:15-15:35	IV-3_3/O	A. Klein	15:05-15:25	IV-4_3/O	Chang Sub Kim	15:05-15:25	IV-6_25/O	Mohammad Kassem
			15:35-15:55	IV-3_4/O	K.-M. Weitzel	15:25-15:45	IV-4_4/O	Klaus-Dieter Becker			
15:55-16:15	**COFFEE BREAK**		**15:55-16:15**	**COFFEE BREAK**		**15:45-16:15**	**COFFEE BREAK**		**15:25-16:15**	**COFFEE BREAK**	
			IV-3/2			**IV-4/2**					
			Chairperson: Rotraut Merkle			**Chairpersons: Henny Bouwmeester, Klaus-Dieter Becker**					
			16:15-16:40	IV-3_5/I	F. Mulder						
			16:40-17:00	IV-3_6/O	N. Horiuchi	16:15-16:40	IV-4_5/I	Vladan Stevanovic			
			17:00-17:20	IV-3_7/O	E. Gilardi	16:40-17:00	IV-4_6/O	Atsushi Mineshige			
			17:20-17:40	IV-3_8/O	S. Mascotto	17:00-17:20	IV-4_7/O	Tanmoy Paul			
			17:40-18:00	IV-3_9/O	A. Klimkowicz	17:20-17:40	IV-4_8/O	Pooja Panchmatia			
18:20-20:00	**PRESENTATION OF YOUNG SCIENTIST & MID CAREER AWARDS**										

WEDNESDAY 21st JUNE

I-1 – BEYOND LITHIUM BATTERIES: IONIC TRANSPORT IN POST-LI SYSTEMS	*I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS*	*I-3 – ALL SOLID-STATE BATTERIES*	*I-5 – POLYMER ELECTROLYTE IONOMERS: ADVANCES IN CATION- AND ANION-EXCHANGE MEMBRANES AND ION CONDUCTION*
Room: B2	**Room: B7**	**Room: B1**	**Room: B9**

Chairperson: John A. Kilner

08:00-08:45 — **PLENARY – Mogens Mogensen**

08:45-09:00 — **BREAK**

I-1/7
Chairpersons: John Muldoon, Federico Bertasi

9:00-9:25	I-1_26/I	D. Golodnitsky
9:25-9:45	I-1_27/O	Tomonari Takeuchi
9:45-10:05	I-1_28/O	Catia Arbizzani
10:05-10:25	I-1_29/O	Aishui Yu
10:25-10:45	I-1_30/O	Silvia Bodoardo

10:45-11:00 — **COFFEE BREAK**

12:20-14:20 — **LUNCH**

08:45-09:00 — **BREAK**

I-2/12
Chairpersons: Clare Grey, Stefano Passerini

9:00-9:25	I-2_48/I	Shinichi Komaba
9:25-9:45	I-2_49/O	M. Galceran
9:45-10:05	I-2_50/O	Jennifer Heath
10:05-10:25	I-2_51/O	Benoit Fleutot
10:25-10:45	I-2_52/O	Hailei Zhao

10:45-11:00 — **COFFEE BREAK**

I-2/13
Chairpersons: Shinichi Komaba, Stefano Passerini

11:00-11:20	I-2_53/O	Janina Molenda
11:20-11:40	I-2_54/O	Yan Yu
11:40-12:00	I-2_55/O	Valentina Dall'Asta
12:00-12:20	I-2_56/O	Francesca De Giorgio
12:20-12:40	I-2_57/O	Daisuke Asakura

12:40-14:20 — **LUNCH**

08:45-09:00 — **BREAK**

I-3/13: Battery Session 5
Chairpersons: Ellen Ivers-Tiffée, Andreas Nenning

9:00-9:30	I-3_56/K	Ellen Ivers-Tiffée
9:30-9:50	I-3_57/O	Sabine Zybell
9:50-10:10	I-3_58/O	Philipp Braun
10:10-10:30	I-3_59/O	Naoaki Kuwata
10:30-10:50	I-3_60/O	John Ostraner

10:50-11:00 — **COFFEE BREAK** — **COFFEE BREAK**

I-3/14: Li-electrolytes
Chairpersons: Ellen Ivers-Tiffée, Andreas Nenning

11:00-11:25	I-3_61/I	Wolfgang Zeier
11:25-11:45	I-3_62/O	Francesco Ciucci
11:45-12:05	I-3_63/O	Stephen R. Yeandel
12:05-12:25	I-3_64/O	Gunars Bajars
12:25-12:45	I-3_65/O	Mattia Saccoccio

12:45-14:20 — **LUNCH**

08:45-09:00 — **BREAK**

I-5/1
Chairperson: Andrew M. Herring

9:00-9:25	I-5_1/I	M. Guiver
9:25-9:50	I-5_2/I	P. Knauth
9:50-10:10	I-5_3/O	P. Jannasch
10:10-10:30	I-5_4/O	K. Vezzù

10:30-11:00 — **COFFEE BREAK**

I-5/2
Chairperson: Patric Jannasch

11:00-11:25	1-5_5/I	B. Pivovar
11:25-11:45	1-5_6/O	A. G. Divekar
11:45-12:05	1-5_7/O	A. M. Herring
12:05-12:25	1-5_8/O	G. Nawn

12:25-14:20 — **LUNCH**

EXCURSION

WEDNESDAY 21st JUNE

	I-8 – CERAMIC PROTON AND HYDRIDE ION CONDUCTORS		*I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS*			*I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS*			*I-11 – FUNCTIONAL METAL OXIDE INTERFACES IN EFFICIENT ELECTROCHEMICAL ENERGY CONVERSION, BIOMASS CONVERSION AND CHARGE STORAGE SYSTEMS*		
	Room: A3		**Room: A2**			**Room: B6**			**Room: B4**		
					Chairperson: John A. Kilner						
08:00-08:45					**PLENARY – Mogens Mogensen**						
08:45-09:00		**BREAK**	**08:45-09:00**		**BREAK**	**08:45-09:00**		**BREAK**	**08:45-09:00**		**BREAK**
	I-8/9		**I-9/12: SOEC - Proton Ceramic Electrolyzers**			**I-10/9**			**I-11/2**		
	Chairperson: Donglin Han		**Chairperson: Rotraut Merkle**			**Chairperson: Alberto Gasparotto**			**Chairpersons: Sebastian Fiechter, Csaba Janàky**		
9:00-9:25	I-8_38/I	Sandrine Ricote	9:00-9:20	I-9_57/O	R. Strandbakke	9:00-9:25	I-10_36/I	H. Kusic	9:00-9:25	I-11_6/I	G. Rupprechter
9:25-9:45	I-8_39/O	Donglin Han	9:20-9:40	I-9_58/O	E. Vøllestad	9:25-9:45	I-10_37/O	U. Lavrencic Stangar	9:25-9:50	I-11_7/I	Z. Sojka
9:45-10:05	I-8_40/O	Yutaro Yagi	9:40-10:00	I-9_59/O	D. Huan	9:45-10:05	I-10_38/O	L. Sanchez Granados	9:50-10:15	I-11_8/I	I. A. Rutkowska
10:05-10:25	I-8_41/O	Yuji Okuyama	10:00-10:20	I-9_60/O	R. Peng	10:05-10:25	I-10_39/O	F. Fresno	10:15-10:35	I-11_9/O	W. Mustain
10:25-10:45	I-8_42/O	Dmitry Tsvetkov	10:20-10:40	I-9_61/O	F. Kosaka	10:25-10:45	I-10_40/O	V. Golovanov			
10:45-11:00		**COFFEE BREAK**	**10:40-11:00**		**COFFEE BREAK**	**10:45-11:00**		**COFFEE BREAK**	**10:35-11:00**		**COFFEE BREAK**
	I-8/10		**I-9/13: SOFC Cathodes V - Stability Issues**			**I-10/10**			**I-11/3**		
	Chairpersons: Yoshihiro Yamazaki, Maria Gomez		**Chairperson: Edith Bucher**			**Chairperson: Luis Sanchez**			**Chairpersons: Ruhlmann Laurent, Zbigniew Sojka**		
11:00-11:25	I-8_43/I	Maria Gomez	11:00-11:20	I-9_62/O	V. Thoréton	11:00-11:25	I-10_41/I	L. Mayrhofer			
11:25-11:45	I-8_44/O	Seikh M.H. Rahman	11:20-11:40	I-9_63/O	L.-S. Unger	11:25-11:45	I-10_42/O	G. Carraro	11:00-11:25	I-11_10/I	P. Zelenay
11:45-12:05	I-8_45/O	Adrien Perrichon	11:40-12:00	I-9_64/O	L. Almar	11:45-12:05	I-10_43/O	S. Murcia-López	11:25-11:50	I-11_11/I	S. Cavaliere
12:05-12:25	I-8_46/O	Mateusz Tarach	12:00-12:20	I-9_65/O	R. Ruhl	12:05-12:25	I-10_44/O	M. E. Fragalà	11:50-12:15	I-11_12/I	S. Fiechter
12:25-12:45	I-8_47/O	Chiara Ferrara	12:20-12:40	I-9_66/O	W. Sitte				12:15-12:35	I-11_13/O	Y. Gao
12:45-14:20		**LUNCH**	**12:40-14:20**		**LUNCH**	**12:25-14:20**		**LUNCH**	**12:35-14:20**		**LUNCH**

EXCURSION

WEDNESDAY 21st JUNE

I-12 – DEFECT CHEMISTRY, TRANSPORT AND REACTIVITY AT GAS/ELECTRODE INTERFACES	*I-15 – PHOTOCHEMICAL AND PHOTOCATALYTIC ENERGY CONVERSION*	*I-16 – SOLAR THERMOCHEMICAL CYCLES BASED ON REDOX-ACTIVE OXYGEN-CONDUCTING METAL OXIDES*	*II-1 – LOW-DIMENSIONAL IONIC AND MIXED IONIC/ELECTRONIC CONDUCTOR NANOSTRUCTURES*
Room: B10	**Room: A7**	**Room: A6**	**Room: A5**

Chairperson: John A. Kilner

08:00-08:45 **PLENARY – Mogens Mogensen**

08:45-09:00		**BREAK**	**08:45-09:00**		**BREAK**	**08:45-09:00**		**BREAK**	**08:45-09:00**		**BREAK**
	I-12/9			**I-15/5**			**I-16/1**			**II-1/1**	
	Chairperson: David Mueller			**Chairperson: Francesca Toma**			**Chairperson: Ellen Stechel**			**Chairperson: Stephen Skinner**	
9:00-9:25	I-12_36/I	Koji Amezawa	9:00-9:30	I-15_16/K	Roel van de Krol	9:00-9:30	I-16_1/K	James Miller	9:00-9:25	II-1_1/I	Jianhua Joshua Yang
9:25-9:45	I-12_37/O	Samuel Cooper	9:30-10:00	I-15_17/K	Thomas Bein	9:30-9:55	I-16_2/I	Juan M. Coronado	9:25-9:50	II-1_2/I	Alexander Chroneos
9:45-10:05	I-12_38/O	Tsuyoshi Nagasawa	10:00-10:20	I-15_18/O	Jason Cooper	9:55-10:20	I-16_3/I	Gregory S. Jackson	9:50-10:10	II-1_3/O	S. N. V. Karra
10:05-10:25	I-12_39/O	Tobias Huber	10:20-10:40	I-15_19/O	Simelys Hernandez	10:20-10:40	I-16_4/O	Andrea Ambrosini	10:10-10:30	II-1_4/O	G. M. Choi
10:25-10:45	I-12_40/O	Gregor Klinser									
10:45-11:00		**COFFEE BREAK**	**10:40-11:00**		**COFFEE BREAK**	**10:40-11:00**		**COFFEE BREAK**	**10:30-11:00**		**COFFEE BREAK**
	I-12/10			**I-15/6**			**I-16/2**			**II-1/2**	
	Chairperson: K. Amezawa			**Chairperson: Roel van de Krol**			**Chairperson: Andrea Ambrosini**			**Chairperson: John Kilner**	
11:00-11:25	I-12_41/I	David Mueller	11:00-11:30	I-15_20/K	Holger Dau	11:00-11:25	I-16_5/I	Sophia Haussener	11:00-11:25	II-1_5/I	Chia-Chin Chen
11:25-11:45	I-12_42/O	Christian Lenser	11:30-12:00	I-15_21/K	Greta R. Patzke	11:25-11:50	I-16_6/I	A. Konstandopoulos	11:25-11:50	II-1_6/I	Monica Burriel
11:45-12:05	I-12_43/O	Ting Chen	12:00-12:30	I-15_22/K	Artur Braun	11:50-12:15	I-16_7/I	Ivan Ermanoski	11:50-12:15	II-1_7/I	William Bowman
12:05-12:25	I-12_44/O	Holger Fritze							12:15-12:40	II-1_8/I	Aleksandra Vojvodic
									12:40-13:00	II-1_9/O	Rouger De Souza
12:25-14:20		**LUNCH**	**12:30-14:20**		**LUNCH**	**12:15-14:20**		**LUNCH**	**13:00-14:20**		**LUNCH**

EXCURSION

WEDNESDAY 21st JUNE

II-3 – THE SCIENCE AND TECHNOLOGY OF 2D MATERIALS			***II-4 – IONICS OF MEMRISTOR/RESISTIVE SWITCHES***			***IV-3 - INTERFACIAL PROCESSES AND NANOIONICS***			***IV-4 - POINT DEFECT CHEMISTRY OF OXIDE MATERIALS***		
Room: B2			**Room: B3**			**Room: B5**			**Room: A4**		
			Chairperson: John A. Kilner								
08:00-08:45			**PLENARY – Mogens Mogensen**								
08:45-09:00		**BREAK**	**08:45-09:00**		**BREAK**	**08:45-09:00**		**BREAK**	**08:45-09:00**		**BREAK**
			II-4/5				**IV-3/3**			**IV-4/3**	
			Chairperson: Manfred Martin				**Chairperson: K. Funke**			**Chairpersons: Yue Qi, Juergen Fleig**	
			9:00-9:25	II-4_17/I	M. J. Marinella	9:00-9:30	IV-3_10/K	W. Chueh	9:00-9:25	IV-4_9/I	Eugene Kotomin
			9:25-9:50	II-4_18/I	X. Guo	9:30-9:50	IV-3_11/O	M. T. Elm	9:25-9:50	IV-4_10/I	Yoed Tsur
			9:50-10:15	II-4_19/I	A. Talin	9:50-10:10	IV-3_12/O	I. Riess	9:50-10:10	IV-4_11/O	Ting Hei Wan
			10:15-10:35	II-4_20/O	D. Shang	10:10-10:30	IV-3_13/O	J. Shi	10:10-10:30	IV-4_12/O	Anders Lindman
10:40-11:00		**COFFEE BREAK**	**10:35-11:00**		**COFFEE BREAK**	**10:30-11:00**		**COFFEE BREAK**	**10:30-11:00**		**COFFEE BREAK**
II-3/2			**II-4/6**			**IV-3/4**			**IV-4/4**		
Chairperson: Xinliang Feng			**Chairperson: Manfred Martin**			**Chairperson: Klaus-Dieter Becker**			**Chairpersons: Eugene Kotomin,**		
11:00-11:25	II-3_7/I	Stefano Passerini	11:00-11:25	II-4_21/I	A. Kenyon	11:00-11:25	IV-3_14/I	J. Sagiv	**Maytal Caspary Toroker**		
11:25-11:45	II-3_8/O	Jian Wang	11:25-11:45	II-4_22/O	M. Moors	11:25-11:45	IV-3_15/O	D. Kalaev	11:00-11:20	IV-4_13/O	Yue Qi
11:45-12:05	II-3_9/O	Haiyan Sun	11:45-12:05	II-4_23/O	S. Yamaguchi	11:45-12:05	IV-3_16/O	N. W. Kwak	11:20-11:45	IV-4_14/I	Juergen Fleig
12:05-12:25	II-3_10/O	Matthias Kühne							11:05-12:05	IV-4_15/O	Alexander Schmid
12:25-12:45	II-3_11/O	G. Giambastiani							12:05-12:25	IV-4_16/O	Till Frömling
12:45-13:10	II-3_12/I	Vittorio Pellegrini									
13:10-14:20		**LUNCH**	**12:05-14:20**		**LUNCH**	**12:05-14:20**		**LUNCH**	**12:25-14:20**		**LUNCH**
EXCURSION											

THURSDAY 22nd JUNE

	I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS		*I-3 – ALL SOLID-STATE BATTERIES*		*I-5 – POLYMER ELECTROLYTE IONOMERS: ADVANCES IN CATION- AND ANION-EXCHANGE MEMBRANES AND ION CONDUCTION*		*I-6 – HIGH-TEMPERATURE PROTON-CONDUCTING POLYMER MEMBRANES*	
	Room: B7		**Room: B1**		**Room: B9**		**Room: B10**	
			Chairperson: Harry Tuller					
08:00-08:45			**PLENARY – Stanley Whittingham**					
08:45-09:00	**BREAK**		**08:45-09:00**	**BREAK**	**08:45-09:00**	**BREAK**	**08:45-09:00**	**BREAK**
09:00-10:40			**ISSI Elections**					
10:40-11:00	**COFFEE BREAK**		**10:40-11:00**	**COFFEE BREAK**	**10:40-11:00**	**COFFEE BREAK**	**10:40-11:00**	**COFFEE BREAK**
	I-2/14		**I-3/15: Modelling session**		**I-5/3**			
	Chairpersons: Atsuo Yamada, Cristina Tealdi		**Chairperson: Wolfang Zeier**		**Chairperson: Vito Di Noto**			
11:05-11:30	I-2_58/I	Kisuk Kang	11:00-11:25 I-3_66/I	Yang Shao-Horn	11:00-11:25 1-5_9/I	I. Nicotera		
11:30-11:50	I-2_59/O	Kaspars Kaprans	11:25-11:45 I-3_67/O	Sabrina Sicolo	11:25-11:50 1-5_10/I	C. Bas		
11:50-12:10	I-2_60/O	Michele Fiore	11:45-12:05 I-3_68/O	K. Becker-Steinberger	11:50-12:10 1-5_11/O	R. Narducci		
12:10-12:30	I-2_61/O	Sevi Murugavel	12:05-12:25 I-3_69/O	Hisatsugu Yamasaki	12:10-12:30 1-5_12/O	D. Gelman		
			12:25-12:45 I-3_70/O	Dave Case				
12:30-14:20	**LUNCH**		**12:45-14:20**	**LUNCH**	**12:30-14:20**	**LUNCH**	**12:20-14:20**	**LUNCH**
	I-2/15		**I-3/16: Modelling/Interfaces Session**		**I-5/4**			
	Chairpersons: Kisuk Kang, Craig Fisher		**Chairpersons: Mickael Dolle, Sven Uhlenbruck**		**Chairperson: Peter Pintauro**			
			14:15-14:40 I-3_71/I	Randy Jalem	14:20-14:45 1-5_13/I	W. Mustain		
14:20-14:45	I-2_62/I	Maria Forsyth	14:40-15:00 I-3_72/O	Issei Sugiyama	14:45-15:10 1-5_14/I	N. Li		
14:45-15:05	I-2_63/O	Da Huo	15:00-15:20 I-3_73/O	Simon Lorger	15:10-15:30 1-5_15/O	L. Dos Santos		
15:05-15:25	I-2_64/O	Hailei Zhao	15:20-15:40 I-3_74/O	Yoshitaka Tateyama	15:30-15:50 1-5_16/O	Y. Nagao		
15:25-15:45	I-2_65/O	Li-Zhen Fan	15:40-16:00 I-3_75/O	Mahunnop Fakkao				
15:45-16:15	**COFFEE BREAK**		**16:00-16:15**	**COFFEE BREAK**	**15:50-16:15**	**COFFEE BREAK**	**15:55-16:15**	**COFFEE BREAK**
	I-2/16		**I-3/17**		**I-5/5**		**I-6/1**	
	Chairpersons: Maria Forsyth, Craig Fisher		**Chairpersons: Mickael Dolle, Sven Uhlenbruck**		**Chairperson: Michael Hickner**		**Chairperson: Werner Lehnert**	
16:15-16:40	I-2_66/I	Youngsik Kim	16:20-16:45 I-3_76/I	Miaofang Chi	16:15-16:40 1-5_17/I	M. Casciola	16:15-16:40 I-6_1/I	Brian Benicewicz
16:40-17:00	I-2_67/O	Arianna Moretti	16:45-17:05 I-3_77/O	René Hausbrand	16:40-17:05 1-5_18/I	Y.-S. Sanchez	16:40-17:05 I-6_2/I	Jochen Kerres
17:00-17:20	I-2_68/O	Alessandro Dell'Era	17:05-17:25 I-3_78/O	Gulin Vardar	17:05-17:25 1-5_19/O	T. Saatkamp	17:05-17:30 I-6_3/I	Maria Luisa Di Vona
17:20-17:40	I-2_69/O	Hailei Zhao	17:25-17:45 I-3_79/O	Ori Yeheskel	17:25-17:45 1-5_20/O	S. Angioni	17:30-17:50 I-6_4/O	Andrew Herring
17:40-18:05	IV-2_6/I	Zhaoyin Wen	17:45-18:05 I-3_80/O	Jong-Sook Lee	17:45-18:05 1-5_21/O	X. Zhang	17:50-18:15 I-6_5/I	Pierre Boillat
18:20 - 20:00			**POSTER Session S2**					

THURSDAY 22nd JUNE

I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS	*I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS*	*I-11 – FUNCTIONAL METAL OXIDE INTERFACES IN EFFICIENT ELECTROCHEMICAL ENERGY CONVERSION, BIOMASS CONVERSION AND CHARGE STORAGE SYSTEMS*	*I-12 – DEFECT CHEMISTRY, TRANSPORT AND REACTIVITY AT GAS/ELECTRODE INTERFACES*
Room: A2	**Room: B6**	**Room: B4**	**Room: B10**

Chairperson: Harry L. Tuller

08:00-08:45 — **PLENARY – Stanley Whittingham**

08:45-09:00 — **BREAK**

09:00-10:40 — **ISSI Elections**

10:40-11:00 — **COFFEE BREAKK**

I-9/14: SOFC Cathodes VI
Chairperson: Gyeong Man Choi

11:00-11:20	I-9_67/O	A. Abdoun
11:20-11:40	I-9_68/O	J. H. Shim
~~11:40-12:00~~	~~I-9_69/O~~	~~G. Gauthier~~
11:40-12:00	I-9_13/O	Y. Gao
12:00-12:20	I-9_70/O	J. H. Shim

12:20-14:20 — **LUNCH**

I-9/15: SOFC Cathodes VII - Composites
Chairperson: Henny Bouwmeester

14:20-14:40	I-9_71/O	F. Shin
14:40-15:00	I-9_72/O	P. Singh
15:00-15:20	I-9_73/O	O. Celikbilek
15:20-15:40	I-9_74/O	S. Javadpour
15:40-16:00	I-9_75/O	R. B. Cervera

16:00-16:15 — **COFFEE BREAK**

I-9/16: SOFC Anodes III and SOECs
Chairperson: John Irvine

16:15-16:35	I-9_76/O	M. Gerstl
16:35-16:55	I-9_77/O	Z. Shao
16:55-17:15	I-9_78/O	D. Tripkovic
17:15-17:35	I-9_79/O	Y. Li
17:35-17:55	I-9_80/O	J. Bartoszek
17:55-18:15	I-9_81/O	M. Torrell

10:40-11:00 — **COFFEE BREAK**

I-10/11
Chairperson: Chiara Maccato

11:00-11:25	I-10_45/I	H. Renevier
11:25-11:45	I-10_46/O	F. Scaramuzzo
11:45-12:05	I-10_47/O	D. Meroni
12:05-12:25	I-10_48/O	M. V. Diamanti

12:25-14:20 — **LUNCH**

I-10/12
Chairperson: Alberto Gasparotto

14:20-14:45	I-10_49/I	E. Comini
14:45-15:05	I-10_50/O	D. Ziegler
15:05-15:25	I-10_51/O	F. Stadler

15:25-16:15 — **COFFEE BREAK**

I-10/13
Chairperson: Urska Lavrencic Stangar

16:15-16:35	I-10_52/O	A. Gaiardo
16:35-16:55	I-10_53/O	M. Sturaro
16:55-17:15	I-10_54/O	U. Anselmi Tamburini
17:15-17:35	I-10_55/O	L. Pasquardini

10:40-11:00 — **COFFEE BREAK**

I-11/4
Chairpersons: Gunther Rupprechter, Pawel Kulesza

11:00-11:25	I-11_14/I	J. Errington
11:25-11:50	I-11_15/I	R. Laurent
11:50-12:15	I-11_16/I	J. Augustynski
12:15-12:40	I-11_17/I	K. Rajeshwar
12:40-13:05	I-11_18/I	A. W. Hassel

13:05-14:20 — **LUNCH**

I-11/5
Chairpersons: Enn Lust, Jan Augustynski

14:20-14:40	I-11_19/O	F. Fenini
14:40-15:00	I-11_20/O	J. M. Serra
15:00-15:20	I-11_21/O	F. Mulder
15:20-15:40	I-11_22/O	K. Miyazaki
15:40-16.00	I-11_23/O	J. Hui

16:00-16:15 — **COFFEE BREAK**

I-11/6
Chairpersons: Nicolas Alonso-Valente, Sara Cavaliere

16:15-16:35	I-11_24/O	N. Tarasova
16:35-16:55	I-11_25/O	A. Mielewczyk-Gryń
16:55-17:15	I-11_26/O	J.-S. Park
17:15-17:35	I-11_27/O	R. Ihringer
17:35-17:55	I-11_28/O	N. Sullivan
17:55-18:15	I-11_29/O	P. Priimägi

10:40-11:00 — **COFFEE BREAK**

I-12/11
Chairperson: Tatsuya Kawada

11:00-11:20	I-12_45/O	Murat Bektas
11:20-11:40	I-12_46/O	Geyu Lu
11:40-12:00	I-12_47/O	Geyu Lu
12:00-12:20	I-12_48/O	Michal Struzik

12:20-14:20 — **LUNCH**

15:55-16:15 — **COFFEE BREAK**

18:20 - 20:00 — **POSTER Session S2**

THURSDAY 22nd JUNE

	I-16 – SOLAR THERMOCHEMICAL CYCLES BASED ON REDOX-ACTIVE OXYGEN-CONDUCTING METAL OXIDES		*I-17 – MESOSCOPIC SOLAR CELLS*		*II-1 – LOW-DIMENSIONAL IONIC AND MIXED IONIC/ELECTRONIC CONDUCTOR NANOSTRUCTURES*		*II-2 – REALIZATION OF NEW FUNCTIONAL OPTOELECTRONIC OXIDE BASED MATERIALS: EXPERIMENT AND THEORY*	
	Room: A6		**Room: A7**		**Room: A5**		**Room: B8**	
				Chairperson: Harry Tuller				
08:00-08:45				**PLENARY – Stanley Whittingham**				
08:45-09:00		**BREAK**	**08:45-09:00**	**BREAK**	**08:45-09:00**	**BREAK**	**08:45-09:00**	**BREAK**
09:00-10:40				**ISSI Elections**				
10:40-11:00		**COFFEE BREAK**	**10:40-11:00**	**COFFEE BREAK**	**10:40-11:00**	**COFFEE BREAK**	**10:40-11:00**	**COFFEE BREAK**
	I-16/3			**I-17/1**		**II-1/3**		**II-2/3**
	Chairperson: William Chueh			**Chairperson: Emmanuelle Delporte**		**Chairperson: Jennifer Rupp**		**Chairperson: David Ginley**
11:00-11:30	I-16_8/K	Martin Roeb	11:00-11:25	I-17_1/I F. Sauvage	11:00-11:25	II-1_10/I X. Guo	11:00-11:25	II-2_8/I Hiroshi Mizoguchi
11:30-11:55	I-16_9/I	Wojciech Lipiński	11:25-11:50	I-17_2/I T. Lund	11:25-11:50	II-1_11/I Wooo Chul Jung	11:25-11:50	II-2_9/I Andreas Klein
11:55-12:15	I-16_10/O	Ryo Hishinuma	11:50-12:10	I-17_3/O S. Ardo	11:50-12:15	II-1_12/I Felix Gunkel	11:50-12:15	II-2_10/I Oliver Bierwagen
12:15-12:35	I-16_11/O	Mikhail Patrakeev	12:10-12:30	I-17_4/O M. Falco	12:15-12:40	II-1_13/I S. Kim		
					12:40-13:00	II-1_14/O F. Ciucci		
12:35-14:20		**LUNCH**	**12:30-14:20**	**LUNCH**	**13:00-14:20**	**LUNCH**	**12:15-14:20**	**LUNCH**
	I-16/4			**I-17/2**		**II-1/4**		
	Chairperson: Ellen Stechel			**Chairperson: Frédéric Sauvage**		**Chairperson: Vincenzo Esposito**		
14:20-14:45	I-16_12/I	Chris Wolverton	14:20-14:45	I-17_5/I E. Deleporte	14:20-14:45	II-1_15/I C. Korte		
14:45-15:10	I-16_13/I	Charles Musgrave	14:45-15:10	I-17_6/I S: Meloni	14:45-15:05	II-1_16/O Edwin Garcia		
15:10-15:30	I-16_14/O	A. Konstandopoulos	15:10-15:30	I-17_7/O S. Azmi	15:05-15:25	II-1_17/O Simone Sanna		
15:30-15:50	I-16_15/O	Jennifer Rupp	15:30-15:50	I-17_8/O B. Taheri	~~15:25-15:45~~	~~II-1_18/O C. Graves~~		
15:50-16:15		**COFFEE BREAK**	**15:50-16:15**	**COFFEE BREAK**	**15:45-16:15**	**COFFEE BREAK**		
	I-16/5			**I-17/3**		**Joint Session (Room: A3)**		
	Chairperson: Andrea Ambrosini			**Chairperson: Simone Meloni**		**Chairpersons: Yoed Tsur, Nini Pryds, Peter Crozier**		
16:15-16:40	I-16_16/I	Ronald Michalsky	16:15-16:40	I-17_9/I A. Gagliardi	16:15-16:45	IV-4_26/K Bilge Yidiz		
16:40-17:05	I-16_17/I	Peter Loutzenhiser	16:40-17:00	I-17_10/O M. Bonomo	16:45-17:10	IV-4_27/I Rouger De Souza		
17:05-17:30	I-16_18/I	Jonathan Scheffe	17:00-17:20	I-17_11/O J. Tiwari	17:10-17:35	II-1_19/I Thomas Lippert		
17:30-17:50	I-16_19/O	Junji Hyodo	17:20-17:40	I-17_12/O N. Ataollahi	17:35-18:00	II-1_20/I Dillon Fong		
18:20 - 20:00				**POSTER Session S2**				

THURSDAY 22nd JUNE

II-3 – THE SCIENCE AND TECHNOLOGY OF 2D MATERIALS	*II-4 – IONICS OF MEMRISTOR/RESISTIVE SWITCHES*	*III-1– IONICS MEETS BIOSCIENCE*	*IV-3 - INTERFACIAL PROCESSES AND NANOIONICS*
Room: B2	**Room: B3**	**Room: B8**	**Room: B5**
	Chairperson: Harry Tuller		
08:00-08:45	**PLENARY – Stanley Whittingham**		
08:45-09:00 BREAK	**08:45-09:00 BREAK**	**08:45-09:00 BREAK**	**08:45-09:00 BREAK**
09:00-10:40	**ISSI Elections**		
10:40-11:00 COFFEE BREAK	**10:40-11:00 COFFEE BREAK**	**10:40-11:00 COFFEE BREAK**	**10:40-11:00 COFFEE BREAK**
II-3/3	**II-4/7**		**IV-3/5**
Chairperson: Vittorio Pellegrini	**Chairperson: Joshua Yang**		**Chairperson: Shu Yamaguchi**
11:00-11:30 II-3_13/K Tony F. Heinz	11:00-11:25 II-4_24/I Y. Iwasa		11:00-11:30 IV-3_17/K R. O'Hayre
11:30-11:55 II-3_14/I Marco Polini	11:25-11:50 II-4_25/I R. Dittmann		11:30-11:55 IV-3_18/I T. S. Bjørheim
11:55-12:20 II-3_15/I Goki Eda	11:50-12:10 II-4_26/O M. Lübben		11:55-12:15 IV-3_19/O G. Wahnström
12:20-12:40 II-3_16/O Stefano Lupi			
12:40-14:20 LUNCH	**12:10-14:20 LUNCH**		**12:15-14:20 LUNCH**
II-3/4	**II-4/8**		**IV-3/6**
Chairperson: Luigi Colombo	**Chairperson: Joshua Yang**		**Chairperson: Tor Bjørheim**
14:20-14:50 II-3_17/K Andrea Ferrari	14:20-14:45 II-4_27/I Y. Naitoh		14:20-14:45 IV-3_20/I S. Yamaguchi
14:50-15:15 II-3_18/I Amaia Zurutuza	14:45-15:10 II-4_28/I Q. Xia		14:45-15:05 IV-3_21/O S. Stub
15:15-15:35 II-3_19/O John Parthenios	15:10-15:30 II-4_29/O K. Maas		15:05-15:25 IV-3_22/O B. Yildiz
15:35-16:00 II-3_20/I Joshua A. Robinson	15:30-15:50 II-4_30/O D. Pla		15:25-15:45 IV-3_23/O R. Sato
16:00-16:15 COFFEE BREAK	**15:50-16:15 COFFEE BREAK**	**15:55-16:15 COFFEE BREAK**	**15:45-16:15 COFFEE BREAK**
II-3/5		**III-1/3**	
Chairperson: Andrea Ferrari		**Chairperson: Luisa Torsi**	
16:15-16:45 II-3_21/K Maurizio Prato		16:15-16:40 III-1_10/I Fabrizio Torricelli	
16:45-17:10 II-3_22/I Hua Zhang		16:40-17:05 III-1_11/I Barbara Stadlober	
17:10-17:35 II-3_23/I Paolo Samorì		17:05-17:25 III-1_12/O Eleonora Macchia	
17:35-17:55 II-3_24/O Fabrizia Cesca		17:25-17:45 III-1_13/O Rosaria A. Picca	
17:55-18:15 II-3_25/O Alberto Ambrosetti			
18:15-18:35 II-3_26/O Federico Baiutti			
18:20 - 20:00	**POSTER Session S2**		

THURSDAY 22nd JUNE

	IV-4 - POINT DEFECT CHEMISTRY OF OXIDE MATERIALS		*IV-7 – NUCLEAR MAGNETIC RESONANCE IN SOLID STATE IONICS*		
	Room: A3			**Room: A4**	
	Chairperson: Harry Tuller				
08:00-08:45	**PLENARY – Stanley Whittingham**				
08:45-09:00	**BREAK**		**08:45-09:00**		**BREAK**
	ISSI Elections				
10:40-11:00	**COFFEE BREAK**		**10:40-11:00**		**COFFEE BREAK**
	IV-4/5				
	Chairpersons: Roger De Souza, Ashok Kumar Baral				
11:00-11:25	IV-4_17/I	Rotraut Merkle			
11:25-11:50	IV-4_18/I	Francesco Ciucci			
11:50-12:10	IV-4_19/O	Eva Sediva			
12:10-12:30	IV-4_20/O	Oleg Merkulov			
12:30-12:50	IV-4_21/O	Einar Vøllestad			
12:50-14:20	**LUNCH**		**12:20-14:20**		**LUNCH**
	IV-4/6 Special session: Ilan Riess' 75th anniversary				
	Chairperson: Igor Lubomirsky				
14:20-14:45	IV-4_22/I	Joachim Maier			
14:45-15:05	IV-4_23/O	Yoed Tsur			
15:05-15:30	IV-4_24/I	Harry L. Tuller			
15:30-15:55	IV-4_25/I	Ilan Riess			
15:55-16:15	**COFFEE BREAK**		**15:55-16:15**		**COFFEE BREAK**
	IV-4/7 - Joint Session			**IV-7/1**	
	Chairpersons: Yoed Tsur, Nini Pryds, Peter Crozier			**Chairperson: Steve Greenbaum**	
			16:15-16:40	IV-7_1/I	D. Kruk
16:15-16:45	IV-4_26/K	Bilge Yildiz	16:40-17:05	IV-7_2/I	P. Heitjans
16:45-17:10	IV-4_27/I	Roger De Souza	17:05-17:30	IV-7_3/I	M. Wilkening
17:10-17:35	II-1_19/I	Thomas Lippert	17:30-17:50	IV-7_4/O	S. Indris
17:35-18:00	II-1_20/I	Dillon Fong	17:50-18:10	IV-7_5/O	Y. Yang
18:20 - 20:00	**POSTER Session S2**		**18:10 - 20:00**	**POSTER Session S2**	

FRIDAY 23rd JUNE

	I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS Room: B7			*I-3 – ALL SOLID-STATE BATTERIES* Room: B1			*I-4 – IONICS IN "OPEN" BATTERIES (REDOX FLOW BATTERIES)* Room: B3			*I-5 – POLYMER ELECTROLYTE IONOMERS: ADVANCES IN CATION- AND ANION-EXCHANGE MEMBRANES AND ION CONDUCTION* Room: B9		
	I-2/17			**I-3/18**			**I-4/5**			**I-5/6**		
	Chairpersons: Youngsik Kim, Craig Fisher			**Chairpersons: Ainara Aguadero, Randy Jalam**			**Chairperson: Thomas Zawodzinski**			**Chairperson: Peter Pintaro**		
8:00-8:25	I-2_70/I	Aleksandar Matic	8:00-8:25	I-3_81/I	Mickael Dollé							
8:25-8:45	I-2_71/O	Marco Agostini	8:25-8:50	I-3_82/I	Hong Li							
8:45-9:05	I-2_72/O	Lucas Lodovico	8:50-9:10	I-3_83/O	Jérémie Auvergniot	8:35-9:00	I-4_18/I	Maria Skyllas-Kazacos			
9:05-9:25	I-2_73/O	Vallachira Pradeep	9:10-9:30	I-3_84/O	N. C. Rosero Navarro	9:00-9:25	I-4_19/I	Ulrich Stimming	9:10-9:30	1-5_22/O	A. Paraskiva
9:25-9:45	I-2_74/O	Daniele Versaci	9:30-9:50	I-3_85/O	Yoshiharu Uchimoto	~~9:25-9:50~~	~~I-4_20/I~~	~~Xianfeng Li~~	9:30-9:50	1-5_23/O	N. Ataollahi
9:45-10:05	I-2_75/O	Eiji Hosono	9:50-10:10	I-3_86/O	Toyoki Okumura	9:50-10:15	I-4_21/I	Peter Pintauro	9:50-10:10	1-5_24/O	J. Bender
10:05-10:25	I-2_76/O	Hailei Zhao	10:10-10:30	I-3_87/O	Peter Ngene	10:15-10:35	I-4_22/O	Laura Meda	10:10-10:30	1-5_25/O	F. Figueiredo
10:25-11:00		**COFFEE BREAK**	**10:30-11:00**		**COFFEE BREAK**	**10:35-11:00**		**COFFEE BREAK**	**10:30-11:00**		**COFFEE BREAK**
	I-2/18									**I-5/7**	
	Chairpersons: Youngsik Kim, Craig Fisher									**Chairperson: Michael Hickner**	
11:00-11:20	I-2_77/O	Hiroki Moriwake							11:00-11:20	I-5_26/O	AN Shengli
11:20-11:40	I-2_78/O	Li-Zhen Fan							11:20-11:40	I-5_27/O	Y.-K. Choe
11:40-12:00		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**
	Chairperson: Vito Di Noto										
12:00-12:45	**PLENARY – Michael Grätzel**										
12:45-13:15	**CLOSING CEREMONY & REMARKS**										

FRIDAY 23th JUNE

I-6 - HIGH-TEMPERATURE PROTON-CONDUCTING POLYMER MEMBRANES			*I-7 – "POLYMER ELECTROLYTES" - THE UBIQUITY OF IONS AND POLYMER MATERIALS IN DEVICES*			*I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS*			*I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS*		
Room: B10			**Room: B9**			**Room: A2**			**Room: B6**		
I-6/2			**I-7/9**			**I-9/17: Cells and Electrolytes II**			**I-10/14**		
Chairperson: Andrew Herring			**Chairperson: Maria Forsyth**			**Chairperson: Kazunari Sasaki**			**Chairperson: Ettore Fois**		
8:00-8:30	I-6_6/K	Klaus-Dieter Kreuer	8:15-8:40	I-7_35/I	Raman Vedarajan	8:00-8:20	I-9_82/O	T. Liu	8:00-8:25	I-10_56/I	R. Dovesi
8:30-8:55	I-6_7/I	Oxana Ivanova	8:40-9:00	I-7_36/O	Maryam Nojabaee	8:20-8:40	I-9_83/O	M. Torrell Faro	8:25-8:45	I-10_57/O	M. Fabbiani
8:55-9:20	I-6_8/I	Eliana Quartarone	9:00-9:20	I-7_37/O	Akiko Tsurumaki	8:40-9:00	I-9_84/O	D. Maslennikov	8:45-9:05	I-10_58/O	G. Tabacchi
9:20-9:45	I-6_9/I	Dirk Henkensmeier	9:20-9:40	I-7_38/O	S. Selvasekarapandian	9:00-9:20	I-9_85/O	A. Taracón	9:05-9:25	I-10_59/O	N. Tkachenko
9:45-10:10	I-6_10/I	Hans Aage Hjuler	9:40-10:00	I-7_39/O	Federico Bertasi	9:20-9:40	I-9_86/O	M. Han	9:25-9:45	I-10_60/O	A. Massa
10:10-10:35	I-6_11/I	Peter Wagner	10:00-10:20	I-7_40/O	Anji Reddy Polu	9:40-10:00	I-9_87/O	S. Ovtar	9:45-10:05	I-10_61/O	S. Tosoni
			10:20-10:40	I-7_41/O	Kun-lin Liu	10:00-10:20	I-9_88/O	J. De Vero	10:05-10:25	I-10_62/O	S. Boyadjiev
10:35-11:00		**COFFEE BREAK**	**10:40-11:00**		**COFFEE BREAK**	**10:20-11:00**		**COFFEE BREAK**	**10:25-11:00**		**COFFEE BREAK**
I-6/3						**I-9/17: Cells and Electrolytes II**					
Chairperson: Piercarlo Mustarelli						**Chairperson: Kazunari Sasaki**					
11:00-11:20	I-6_12/O	Carsten Korte				11:00-11:20	I-9_89/O	A. Morata			
11:20-11:40	I-6_13/O	Theo Dingemans				11:20-11:40	I-9_90/O	S. P. Jiang			
11:40-12:00		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**
			Chairperson: Vito Di Noto								
12:00-12:45			**PLENARY – Michael Grätzel**								
12:45-13:15			**CLOSING CEREMONY & REMARKS**								

FRIDAY 23rd JUNE

	I-11 – FUNCTIONAL METAL OXIDE INTERFACES IN EFFICIENT ELECTROCHEMICAL ENERGY CONVERSION, BIOMASS CONVERSION AND CHARGE STORAGE SYSTEMS			*I-17 – MESOSCOPIC SOLAR CELLS*			*II-1– LOW-DIMENSIONAL IONIC AND MIXED IONIC/ELECTRONIC CONDUCTOR NANOSTRUCTURES*			*II-3 – THE SCIENCE AND TECHNOLOGY OF 2D MATERIALS*		
	Room: B4			**Room: A7**			**Room: A5**			**Room: B2**		
	I-11/7			**I-17/4**			**II-1/5**			**II-3/6**		
	Chairpersons: Pawel Kulesza, John Errington			**Chairperson: Alessio Gagliardi**			**Chairperson: Nini Pryds**			**Chairperson: Hua Zhang**		
							8:00-8:25	II-1_21/I	A. Tarancón	8:00-8:25	II-3_27/I	Xinliang Feng
	9:00-9:20	I-11_30/O	A. D. Benli	9:00-9:25	I-17_13/I	M. Freitag	8:25-8:50	II-1_22/I	N. Perry	8:25-8:50	II-3_28/I	Aldo Di Carlo
	9:20-9:40	I-11_31/O	H. Liu	9:25-9:50	I-17_14/I	S. Hayase	8:50-9:15	II-1_23/I	P.V. Hendriksen	8:50-9:15	II-3_29/I	Hyeon Suk Shin
	9:40-10:00	I-11_32/O	R. Ihringer	9:50-10:10	I-17_15/O	N. Yaghoobi Nia	9:15-9:40	II-1_24/I	K.V. Hansen	9:15-9:35	II-3_30/O	Beatriz Martin-Garcia
	~~10:00-10:20~~	~~I-11_33/O~~	~~D. Heidari~~	10:10-10:30	I-17_16/O	G. Garcia-Belmonte	9:40-10:05	II-1_25/I	A. Cavallaro	9:35-9:55	II-3_31/O	Babak Taheri
	10:20-10:40	I-11_34/O	M. Koroleva				10:05-10:30	II-1_26/I	M. Kubicek	9:55-10:15	II-3_32/O	Masashi Okubo
										10:15-10:35	II-3_33/O	Emmanuel Stratakis
	10:40-11:00		**COFFEE BREAK**	**10:30-11:00**		**COFFEE BREAK**	**10:30-11:00**		**COFFEE BREAK**	**10:35-11:00**		**COFFEE BREAK**
				I-17/5			**II-1/6**					
				Chairperson: Marina Freitag			**Chairperson: Monica Burriel**					
				11:00-11:20	I-17_17/O	Jong-Sook Lee	11:00-11:25	II-1_27/I	G. Harrington			
				11:20-11:40	I-17_18/O	Shu Yamaguchi	11:25-11:50	II-1_28/I	S. Nonnenmann			
	11:40-12:00		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**	**11:50-12:00**		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**
	Chairperson: Vito Di Noto											
12:00-12:45	**PLENARY – Michael Grätzel**											
12:45-13:15	**CLOSING CEREMONY & REMARKS**											

FRIDAY 23rd JUNE

	III-1– IONICS MEETS BIOSCIENCE			*IV-4 - POINT DEFECT CHEMISTRY OF OXIDE MATERIALS*			*IV-7 – NUCLEAR MAGNETIC RESONANCE IN SOLID STATE IONICS*		
	Room: B8			**Room: A3**			**Room: A4**		
	III-1/4			**IV-4/8**			**IV-7/2**		
	Chairperson: Nicola Cioffi			**Chairpersons: Rotraut Merkle, Francesco Ciucci**			**Chairperson: Mallory Gobet**		
8:35-9:00	III-1_14/I	Maria Asplund	8:30-8:55	IV-4_28/I	Jennifer Rupp	8:00-8:25	IV-7_6/I	K. Hayamizu
9:00-9:25	III-1_15/I	Massimiliano Cavallini	8:55-9:20	IV-4_29/I	Igor Lubomirsky	8:25-8:50	IV-7_7/I	L. Madsen
9:25-9:50	III-1_16/I	Christine Kranz	9:20-9:40	IV-4_30/O	Georgie Wellock	8:50-9:15	IV-7_8/I	M. Shönhoff
9:50-10:15	III-1_17/I	Claudio Fontanesi	9:40-10:00	IV-4_31/O	Jonas J. Neumeier	~~9:15-9:40~~	~~IV-7_9/I~~	~~S. Suarez~~
10:15-10:40	III-1_18/I	Massimo Innocenti	10:00-10:20	IV-4_32/O	Kathrin Michel	9:40-10:05	IV-7_10/I	M. Deschamps
			10:20-10:40	IV-4_33/O	Bilge Yildiz	10:05-10:30	IV-7_11/I	O. Lafon
						10:30-10:50	IV-7_12/O	D. Halat
10:40-11:00		**COFFEE BREAK**	**10:40-11:00**		**COFFEE BREAK**	**10:50-11:00**		**COFFEE BREAK**
				IV-4/9				
				Chairperson: Yoed Tsur				
			11:00-11:20	IV-4_34/O	Hans F. Wardenga			
			11:20-11:40	IV-4_35/O	Hans F. Wardenga			
11:40-12:00		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**	**11:40-12:00**		**COFFEE BREAK**
			Chairperson: Vito Di Noto					
12:00-12:45			**PLENARY – Michael Grätzel**					
12:45-13:15			**CLOSING CEREMONY & REMARKS**					

Daily Program

SUNDAY June 18, 2017

/K = Keynote speaker (30 min)
/I = Invited speaker (25 min)
/O = Oral contribution (20 min)

MACRO AREA 1: IONICS IN ENERGY AND ENVIRONMENT

I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS

A. Padova Fiere

Room A4

10:40 BREAK

I-2/1

Chairmen: Craig A.J. Fisher, Cristina Tealdi

11:00 I-2_1/O
Carbon supported aluminium trifluoride nanoparticles functionalized lithium manganese oxide for the development of advanced lithium ion battery system
Natasha Ross, Shane Willenburg, Emmanuel Iwuoha
University of the Western Cape, Chemistry Department, Robert Sobukwe, Bellville, Cape town, South Africa.

11:20 I-2_3/O
$LiFe_{1-x}M^{II}_xPO_4/C$ (M^{II} = Co, Mn, Ni, Zn) as cathode materials for lithium-ion batteries
Svetlana Novikova [a], Sergey Yaroslavtsev [b], Vyacheslav Rusakov [b], Tatyana Kulova [c], Alexander Skundin [c], Andrey Yaroslavtsev [a]
[a] Kurnakov Institute of general and inorganic chemistry RAS, Leninsky pr. 31, Moscow, Russia. [b] Lomonosov Moscow state university, Leninsky gory 1, Moscow, Russia. [c] Frumkin Institute of physical chemistry and electrochemistry RAS, Leninsky pr. 31, Moscow, Russia.

11:40 I-2_4/O
Maximizing the Effect of Cobalt on Improving the Electrochemical Performance of Ni-rich $LiNi_{0.88}Co_{0.12}O_2$ Cathode Materials
Wensheng Yang, Gang Li, Xu Chen, Changxia Liu
State Key Laboratory of Chemical Resource Engineering, Beijing University of Chemical Technology, Beijing 100029, P.R. China.

12:00 I-2_5/O
Influence of Yttrium substitution on conductivity of $LiNiPO_4$ (Li and Ni sites) for Lithium ion batteries
M. Kalpana [a], S. Selvasekerapandian [a, b]
[a] Department of Nano Science and Technology, Tamilnadu Agricultural University, Coimbatore 641 003, India. [b] Materials Research Centre, Coimbatore 641 045, India.

12:20 LUNCH

I-2/2

Chairmen: Aleksandar Matic, Cristina Tealdi

14:20 I-2_6/O
Mesoporous and Nanostructured TiO_2 Layer with Ultra-high Loading on Nitrogen-doped Carbon Foams as Flexible and Free-standing Electrodes for Lithium-ion Batteries
Shiyong Chu [a], Yijun Zhong [a], Rui Cai [a], Zhaobao Zhang [a], Shenying Wei [a], Zongping Shao [a, b]
[a]Jiangsu National Synergetic Innovation Center for Advanced Materials, State Key Laboratory of Materials-Oriented Chemical Engineering, College of Chemical Engineering, Nanjing Tech University, 210009, China. [b]College of Energy, Nanjing Tech University, 210009, China.

14:40 I-2_7/O
Bundled and Densified Carbon Nanotubes (CNT) Tissues as Flexible Ultra-Light Weight Li-ion Battery Anode Current Collectors
Shani Yehezkel [a, b], Mahmud Auinat [a], Nina Sezin [a], David Starosvetsky [a], and Yair Ein-Eli [a, b]
[a] Department of Materials Science and Engineering, Technion - Israel Institute of Technology, Haifa Israel 3200003. [b] The Nancy and Stephen Grand Technion Energy Program, Technion- Israel Institute of Technology, Haifa Israel 3200003.

15:00 I-2_8/O
A High-Rate and Ultralong-Lifespan Anode Material for Li-Ion Batteries: MoS_2 Nanothorns Epitaxially Grown on CNTs
Zijia Zhang [a], Hailei Zhao [a, b], Zhihong Du [a], Lina Zhao [a], Zhaolin Li [a], Jiejun Fang [a]
[a] University of Science and Technology Beijing, School of Materials Science and Engineering, Beijing 100083, China. [b] Beijing Municipal Key Laboratory of New Energy Materials and Technologies, Beijing 100083, China.

15:20 I-2_9/O
Structural Design and Electrochemical Performances of Tin/Carbon Anode for Lithium-Ion Batteries
Dan Zhou, Li-Zhen Fan
Institute of Advanced Materials and Technology, University of Science and Technology Beijing, Beijing, China, 100083.

15:40 BREAK

I-2/3

Chairmen: Aleksandar Matic, Cristina Tealdi

16:15 I-2_10/O
Nanostructured Hybrid Materials for Lithium-based Batteries
Yanglong Hou
Department of Materials Science and Engineering, College of Engineering, Peking University, Beijing 100871, China.

16:35 I-2_11/O
Development of Adiponitrile-Based Electrolytes for Lithium ion batteries
Niloofar Ebteshami, Elie Paillard
Helmholtz Institute Muenster/FZ-Juelich (IEK-12), Institute of Physical Chemistry, Corrensstra. 46, 48149, Germany.

16:55 I-2_12/O
Robust benzimidazole-based electrolyte overcomes high-voltage and high-temperature applications in 5V class lithium ion batteries
Fu-Ming Wang [a, b]
[a] Graduate Institute of Applied Science and Technology, National Taiwan University of Science and Technology, Taipei, Taiwan. [b]Sustainable Energy Center, National Taiwan University of Science and Technology, Taipei, Taiwan.

I-3 – ALL SOLID-STATE BATTERIES

A. Padova Fiere

Room A3

I-3/1: **POLYMER SESSION**

Chairmen: Yoon Soek Jung, Daniel Rettenwander

9:40 I-3_1/O
The potential of bio-based proton conducting polymer electrolyte CA: NH_4I for electrochemical device application
S. Monisha [a, b], S. Selvasekarapandian [a], T. Mathavan [b], G. Boopathi [a, c], and A. Milton Franklin Benial [b]
[a] Materials Research Center, Coimbatore, Tamilnadu-641 045, India. [b] Research Department of Physics, N.M.S.S. Vellaichamy Nadar College, Madurai, Tamilnadu-625 019, India. [c] Department of Bioenergy, Tamil Nadu Agricultural University, Tamil Nadu-641 003, India.

10:00 I-3_2/O
Experimental Investigation for High Performance Proton Conducting Batteries using Nanocomposite Gel Electrolyte with NH_4SCN: PVA: MWNT system
Neelesh Rai [a], R.P. Kumhar [b], and S. L. Agrawal [c]
[a] Department of Physics, AKS University, Satna (M.P.) India. [b] Department of Physics, Maharaja College, Chhatarpur (M.P.) India. [c] Department of Physics, APS University, Rewa (M.P.) India.

10:20 I-3_3/O
Ion Transport Behavior of Nanocomposite Polymer Electrolyte-(PVA: PVK): CH_3COONH_4: EC: SiO_2 System
R.P. Kumhar [a], Neelesh Rai [b], and S. L. Agrawal [c]
[a] Department of Physics, Govt. Maharaja College Chhatarpur, (M.P.) India. [b] Department of Physics, AKS University Satna, (M.P.) India. [c] Department of Physics, APS University Rewa, (M.P.) India.

10:40 BREAK

I-3/2: **Na-CONDUCTORS SESSION**

Chairmen: Yang Shao Horn, Daniel Rettenwander

11:00 I-3_4/I
Electrochemically Induced Stress and Fracture in Ceramic Electrolytes
Brian W. Sheldon[a], Huajian Gao [a], Kai Guo [a], Mok Yun Jin [a], Cristina Ramirez [a], Giovanna Bucci[b], W. Craig Carter[b], Yet-Ming Chiang[b], Tushar Swamy[b], and Lukas Porz[b,c]
[a] Brown University, School of Engineering, Providence, Rhode Island, 02906, USA. [b] Massachusetts Institute of Technology, Department of Materials Science and Engineering, Cambridge, Mass, 02139, USA. [c] Institute of Material Science, Technische Universität Darmstadt, Darmstadt 64287, Germany.

11:25 I-3_5/O
A Li-ion based electrochemical CO_2 sensor with Li_3BO_3 electrolyte fabricated by a simple brushing and melting technique
Nenning Andreas[a,b], Struzik Michal[a,b], Rupp Jennifer L.M[a].
[a] Massachusetts Institute of Technology, Department of Materials Science and Engineering, Cambridge, Massachusetts 02139, United States. [b] ETH Zürich, Department of Materials, Hönggerbergring 64, 8093 Zürich.

11:45 I-3_6/O
Synthesis and characterization of the NASICON-type solid solutions $Na_{1+2x}Al_xY_xZr_{2-2x}(PO_4)_3$ and $Na_{1+2x}Al_xY_xZr_{2-2x}(SiO_4)_2PO_4$
Sahir Nagash[a,b,c], Qianli Ma[a,b,c], Frank Tietz[a,b,c], Olivier Guillon[a,b,c]
(a) Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Materials Synthesis and Processing (IEK-1), D-52425 Jülich, Germany. (b) Jülich Aachen Research Alliance, JARA-Energy. (c) Helmholtz-Institute Münster, c/o Forschungszentrum Jülich GmbH, D-52425 Jülich, Germany.

12:05 I-3_7/O
Low temperature densification of NASICON ceramics promoted by Na_2O-Nb_2O_5-P_2O_5 glass additive
He Wang, Keisuke Okubo, George Hasegawa, Miki Inada, Naoya Enomoto, Katsuro Hayashi
Department of Applied Chemistry, School of Engineering, Kyushu University,744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan.

12:25 I-3_8/O
Sodium Ion Diffusion in Nasicon ($Na_3Zr_2Si_2PO_{12}$) Solid Electrolytes: Effects of Excess Sodium
Heetaek Park[a], Keeyoung Jung[b], Marjan Nezafati[c], Chang-Soo Kim[c], and Byoungwoo Kang[a]
[a] Department of Materials Science and Engineering, Pohang University of Science and Technology (POSTECH), Po-hang, Gyeongbuk 790-784, South Korea. [b] Energy Storage Materials Research Center, Research Institute of Industrial Science and Technology (RIST), Pohang, Gyeongbuk 790-330, South Korea. [c] Materials Science and Engineering Department, University of Wisconsin-Milwaukee, Milwaukee, WI 53211, USA.

12:45 LUNCH

I-3/3

Chairmen: Brian Sheldon, Craig A.J. Fisher

14:20 I-3_9/I
LGPS-type Solid Electrolytes - Materials Varieties and Their Structure-property Relationships
Satoshi Hori, Kota Suzuki, Masaaki Hirayama and Ryoji Kanno
Department of Chemical Science and Engineering, School of Materials and Chemical Technology, Tokyo Institute of Technology, Yokohama, Japan.

14:45 I-3_10/O
Ionic Properties of the $Li(BH_4)_{0.75}I_{0.25}$–$0.75Li_2S{\cdot}0.25P_2S_5$ Mixed System for Near Room-Temperature All-Solid Li-Ion Batteries
Abdel El Kharbachi[a], Yang Hu[b], Koji Yoshida[c], Magnus H. Sørby[a], Helmer Fjellvåg[b], Shin-ichi Orimo[c,d], Bjørn C. Hauback[a]
[a] Institute for Energy Technology, P.O. Box 40, NO-2027 Kjeller, Norway. [b] Centre for Materials Science and Nanotechnology, University of Oslo, Blindern, Norway. [c] Institute for Materials Research, Tohoku University, Sendai 980-8577, Japan. [d] WPI-Advanced Institute for Materials Research, Tohoku University, Sendai 980-8577, Japan.

15:05 I-3_11/O
High sulfur loading all-solid-state Li-S battery with LiI-Li_3PS_4
Seitaro Ito[a], Ulderico Ulissi[b,c], Alberto Varzi[b,c], Ryo Omoda[a], Taku Watanabe[a], Yuichi Aihara[a], Stefano Passerini[b,c]
[a] Samsung R&D Institute Japan, Semba Nishi 2-1-11, Minoh, 562-0036, Osaka, Japan. [b] Helmholtz Institute Ulm (HIU), Helmholtzstrasse 11, 89081 Ulm, Germany. [c] Karlsruhe Institute of Technology (KIT), P.O. Box 3640, 76021 Karlsruhe, Germany.

15:25 I-3_12/O
Ionic conductivity in light metal intercalated C_{60} compounds
Daniele Pontiroli[a], Silvio Scaravonati[a], Giacomo Magnani[a], Mattia Gaboardi[a], Samuele Sanna[b], Eliana Quartarone[c], Mauro Riccò[a]
[a] Dipartimento di Scienze Matematiche, Fisiche ed Informatiche, Università di Parma, Parma, Italy. [b] Dipartimento di Fisica e Astronomia, Università di Bologna, Bologna, Italy. [c] Dipartimento di Chimica, Università di Pavia, Pavia, Italy.

15:45 I-3_13/O
Nano-composite electrolyte with enhanced conductivity for all-solid-state lithium ion batteries
X.B. Chen[a], P. M. Vereecken[b]
[a] Imec, Kapeldreef 75, B-3001 Leuven, Belgium, Centre for Surface Chemistry and Catalysis, University of Leuven, Kasteel-park Arenberg 23, B-3001 Leuven, Belgium. [b] Imec, Kapeldreef 75, B-3001 Leuven, Belgium, Centre for Surface Chemistry and Catalysis, University of Leuven, Kasteel-park Arenberg 23, B-3001 Leuven, Belgium.

16:05 BREAK

I-3/4

Chairmen: Brian Sheldon, Craig A.J. Fisher

16:25 I-3_14/I
Glass Protected Li Metal Electrodes for Next Generation Batteries
Steven Visco and Eugene Nimon
PolyPlus Battery Company, 2424 6th Street, Berkeley, California USA.

16:50 I-3_15/O
Nanostructured, solution-processible, polyethyleneimine-based single-ion solid polymer eletrolytes for lithium ion batteries
Xiaorui Che, Robert P. Doyle, Anamika Datta, Luis J. Smith, Sergio Granados-Focil
Clark University, Gustaf Carlson School of Chemistry and Biochemistry, 950 Main street, Worcester, MA 01610, USA.

17:10 I-3_16/O
Ionic conductivity of $0.15Na_2O$-$0.85SiO_2$ controlled by the mechanical load
M. Graczyk-Zajac[a], D. Vrankovic[a], K. Webber[b], D.U. Tulyaganov[c], H.R. Fernandes[d]
[a] Department of Materials and Earth Sciences, Technical University Darmstadt, Germany. [b] Department of Materials Science and Engineering, FAU Erlangen-Nürnberg, Germany. [c] Turin Polytechnic University, Tashkent, Uzbekistan. [d] Department of Materials and Ceramic Engineering, CICECO, University of Aveiro, Portugal.

17:30 I-3_17/O
Ion transport properties of Al doped lithium germanium phosphate
Shigang Ling, Jiayue Peng, Jie Huang, Qi Yang, Jiaze Lu, Hong Li
Institute of Physics, Chinese Academy of Sciences, Beijing National Laboratory for Condensed Matter Physics, Beijing, 100190, China.

I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS

A. Padova Fiere

Room A2

I-9/1: **SOFC CATHODES SESSION I**

Chairman: Werner Sitte

11:00 I-9_1/I
Oxygen Transport Properties and Surface Composition of Some Alkaline Earth Free Perovskite Oxide Electrodes
John Druce[a], Helena Tellez[a], Kuan Ting Wu[a,b], Tatsumi Ishihara[a,b], and John A. Kilner[a,c]
[a] International Institute for Carbon-Neutral Energy Research (wpi-I2CNER), Kyushu University, Nishi-ku, Fukuoka 819-0395, Japan. [b] Department of Applied Chemistry, Kyushu University, Nishi-ku, Fukuoka 819-0395, Japan. [c] Department of Materials, Imperial College London, South Kensington, London, SW7 2BP, United Kingdom.

11:25 I-9_2/O
Investigation of $Ba_2Co_9O_{14}$ as an innovative SOFCs cathode material
Ibtissam Kehal, Xavier Flandre, Edouard Capoen, Romain Jooris, Isabella Vasconcelos Joviano Dos Santos, Marie-Hélène Chambrier, Aurélie Rolle, Rose-Noëlle Vannier
Univ. Lille, CNRS, Centrale Lille, ENSCL, Univ. Artois, UMR 8181 - UCCS - Unité de Catalyse et Chimie du Solide, F-59000 Lille, France.

11:45 I-9_3/O
Study of pure and Zr-substituted $YMnO_3$ materials as Solid Oxide Fuel Cell Cathode
Zulma Moreno[a,b], Nicolás Grimaldos[a,c], Alejandra Montenegro[b], Caroline Pirovano[c], Konrad Swierczek[d], Liliana Mogni[b], Alberto Caneiro[b], Pascal Roussel[c], and Gilles Gauthier[a]
[a] Universidad Industrial de Santander, Grupo INTERFASE, Bucaramanga, Santander, Colombia. [b] Centro Atómico de Bariloche, Grupo Caracterización de Materiales y Óxidos no-estequiométricos, San Carlos de Bariloche, Argentina. [c] Unité de Catalyse et Chimie du Solide (UCCS), CNRS UMR 8181, Université de Lille 1, 59655 Villeneuve d´Ascq Cedex, France. [d] AGH University of Science and Technology, Cracow, Poland.

12:05 I-9_4/O
Preparation, advanced electrochemical and microstructural characterizations of the porous SOFCs electrode material $Ca_3Co_4O_{9+\delta}$
Aurélie Rolle[a], Fatiha Medjahed[a], Isabella Vasconcelos Joviano Dos Santos[a], Jean-Philippe Dacquin[a], David Fournier[b], Patrice Woisel[b], Eric Masson[c], Elisabeth Djurado[a], Rose-Noëlle Vannier[a]
[a] Univ. Lille, CNRS, Centrale Lille, ENSCL, Univ. Artois, UMR 8181 - UCCS - Unité de Catalyse et Chimie du Solide, F-59000 Lille, France. [b] Univ. Lille, CNRS, INRA, ENSCL, UMR 8207 - UMET - Unité Matériaux et Transformations, F-59000 Lille, France. [c] Univ. Lille, Univ. Côte d'Opale, EA 4477 - TVES, Territoires Villes Environnement et Sociétés, F-59000 Lille, France. [d] Univ. Grenoble Alpes, LEPMI, 38402 Saint Martin d'Hères, France.

12:25 I-9_5/O
Synthesis, crystal chemistry and electrochemical properties of layered-perovskites for air electrodes for IT-SOFCs
Susana García-Martín[a], Daniel Muñoz-Gil[a], Xabier Martínez de Irujo-Labalde[a], Esteban Urones-Garrote[b], Domingo Pérez-Coll[c]
[a] Complutense University, Department of Inorganic Chemistry, Dpto. de Química Inorgánica, Facultad de Ciencias Químicas, Universidad Complutense, 28040-Madrid, Spain. [b] Complutense University, Centro Nacional de Microscopía Electrónica, Universidad Complutense, 28040-Madrid, Spain. [c] CSIC, Instituto de Cerámica y Vidrio, CSIC, Cantoblanco, 28049-Madrid, Spain.

12:45 LUNCH

I-9/2: **SOFC ANODES SESSION I**

Chairman: Peter Vang Hendriksen

14:20 I-9_6/I
Carbon deposition in solid oxide electrochemical cells: understanding, prevention, and control
Christopher Graves, Theis L. Skafte
Technical University of Denmark, Department of Energy Conversion and Storage, Frederiksborgvej 399, 4000 Roskilde, Denmark.

14:45 I-9_7/O
Designing the Composite $SrVO_3$-$SrTiO_3$ Anodes for Hydrocarbon-Fueled Solid Oxide Fuel Cells
Aleksey Yaremchenko, Javier Macías, Jorge Frade
CICECO – Aveiro Institute of Materials, Department of Materials and Ceramic Engineering, University of Aveiro, 3810-193 Aveiro, Portugal.

15:05 I-9_8/O
Development of Ni-Ba(Ce,Zr,Y)O_3 cermet anode for direct ammonia-fueled SOFCs
Kazunari Miyazaki, Hiroki Muroyama, Toshiaki Matsui, Koichi Eguchi
Department of Energy and Hydrocarbon Chemistry, Graduate School of Engineering, Kyoto University, Kyoto 615−8510, Japan.

15:25 I-9_9/O
Structural and catalytic properties of rare-earth doped ceria layers in SOFCs fueled by biogas
Beata Bochentyn[a], Agata Warych[a], Dagmara Szymczewska[b], Maria Gazda[a], Piotr Jasiński[b]
[a] Faculty of Applied Physics and Mathematics, Gdansk University of Technology, 80-233 Gdańsk, ul. Narutowicza 11/12 Poland. [b] Faculty of Electronics, Telecommunications and Informatics, Gdansk University of Technology, 80-233 Gdańsk, ul. Narutowicza 11/12 Poland.

15:45 BREAK

I-9/3: **MODELLING SESSION I**

Chairman: Jeong Woo Han

16:15 I-9_10/I
***Ab-Initio* Computational Design of Solid Oxide Fuel Cell Cathodes**
Dane Morgan, Ryan Jacobs
University of Wisconsin-Madison, Department of Materials Science and Engineering, 1509 University Avenue, Madison, WI 53706, United States.

16:40 I-9_11/O
Understanding the role of A-site atoms in the catalytic activity of ABO_3 perovskites
Ji Wu[a], Aleksandar Staykov[a], Taner Akbay[b], Tatsumi Ishihara[a,b,c], John A. Kilner[a,d]
[a] Kyushu University, International Institute for Carbon Neutral Energy Research, Motooka 744, Nishi-ku, Fukuoka 802-0395, Japan. [b] Kyushu University, Advanced Research Centre for Electric Energy Storage, Motooka 744, Nishi-ku, Fukuoka 802-0395, Japan. [c] Kyushu University, Department of Applied Chemistry, Motooka 744, Nishi-ku, Fukuoka 802-0395, Japan. [d] Imperial College London, Department of Materials, South Kensington, London SW7 2BP, United Kingdom.

17:00 I-9_12/O
Mechanistic Study for B-site Metal Ex-solution on $PrBaT_xMn_{2-x}O_{5+\delta}$ (T = Mn, Fe, Co, and Ni) under Reduction Conditions
Kyeounghak Kim and Jeong Woo Han
Department of Chemical Engineering, University of Seoul, Seoul 130-743, Korea.

17:20 I-9_13/O (moved on Thursday at 11:40)
Computational and experimental study of the surface segregation in the *in situ* exsolution of Ni nanoparticles for solid oxide fuel cells
Yang Gao and Francesco Ciucci
The Hong Kong University of Science and Technology, Mechanical and Aerospace Engineering, Clearwater Bay, Kowloon, Hong Kong, China SAR.

17:40 I-9_14/O
A TFD study of the hydrogen extraction in a steam-reforming protonic-membrane reactor
D. Catalán Martínez[a], J.M. Serra[a], S. Hernandez Morejudo[b], H. Malerød-Fjeld[b], Christian Kjolseth[b],
[a] Universidad Politécnica de Valencia, CSIC, Instituto de Tecnología Química, Ave los Naranjos S-N, E-46022 Valencia, Spain. [b] CoorsTek Membrane Science, Forskningsparken, Gaustadalleen 21, NO-0349 Oslo, Norway.

Oral Presentations

MONDAY June 19, 2017

PLENARY

A. Padova Fiere

Room A1

Chairman: Hiroyuki Ohno

8:00 P1 – Udo Kragl
Ionic Liquids in Biotechnology and Beyond
Udo Kragl
University of Rostock, Institute of Chemistry, 18051 Rostock, Germany.

8:45 BREAK

MACRO AREA I: IONICS IN ENERGY AND ENVIRONMENT

I-1 – BEYOND LITHIUM BATTERIES: IONIC TRANSPORT IN POST-LI SYSTEMS

B. Fiore di Botta

Room B2

I-1/1

Chairmen: John Muldoon, Federico Bertasi

9:00 I-1_1/I
Solid-State Mobility of Multivalent Cations for Energy Storage Applications
Brian J. Ingram [a], Baris Key[a], John T. Vaughey[a], Patrick J. Bonnick[b], Xiaoqi Sun[b], Linda F. Nazar[b], Pieremanuele Canepa[c], Gopalakrishnan Sai Gautam[c] Gerbrand Ceder[c], Ryan Bayliss[d], and Jordi Cabana[d]
[a] Argonne National Laboratory, Chemical Science and Engineering Department, Argonne IL 60439, USA. [b] University of Waterloo, Department of Chemistry and the Waterloo Institute of Nanotechnology, Waterloo, Ontario N2L 3G1, Canada. [c] Lawrence Berkeley National Laboratory, Materials Science Division, Berkeley CA 94720, USA. [d] University of Illinois Chicago, Department of Chemistry, 845 West Taylor Street, Chicago, IL 60607, USA.

9:25 I-1_2/I
Magnesium Borohydride Complexes as Solid-State Electrolytes for Magnesium Batteries
Elsa Roedern, Ruben-Simon Kühnel, Arndt Remhof and Corsin Battaglia
Materials for Energy Conversion, Empa - Swiss Federal Laboratories for Materials Science and Technology, 8600 Dübendorf, Switzerland.

9:50 I-1_3/I
High Power Rechargeable Mg/I_2 Battery Chemistry
Wei-Qiang Han[a,b], Huajun Tian[b] Chunsheng Wang[c]
[a] Ningbo Institute of Material Technology and Engineering (NIMTE), Chinese Academy of Sciences, Ningbo 315201, P. R. China. [b] School of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, China. [c] Department of Chemical and Biomolecular Engineering, University of Maryland, College Park, Maryland 20740, USA.

10:15 I-1_4/O
Electrochemical performance and mechanism of organic cathode materials in rechargeable Mg batteries
Jan Bitenc[a], Alen Vizintin[a], Klemen Pirnat[a], Anja Kopač Lautar[a], Tanja Bančič[a], Jože Grdadolnik[a], Jernej Stare[a], Anna Radon Vitanova[b], Robert Dominko[a]
[a] National Institute of Chemistry, Hajdrihova 19, 1000 Ljubljana, Slovenia. [b] Honda R&D Europe, Carl-Legien Strasse30, 63073 Offenbach, Germany.

10:35 BREAK

I-1/2

Chairmen: John Muldoon, Federico Bertasi

11:00 I-1_5/I
On intercalation and pseudocapacitance in Mg-ion battery electrodes
Fride Vullum-Bruer[a], Lu Wang[a], Karina Asheim[a], Ann Mari Svensson[a], Bo Jiang[a], Per Erik Vullum[b]
[a] Department of Materials Science and Engineering, Norwegian University of Science and Technology, NO-7491 Trondheim, Norway. [b] SINTEF Materials and Chemistry, NO-7491 Trondheim, Norway.

11:25 I-1_6/I
Reversible Zn^{2+} Intercalation for Electrochemical Energy Storage
Dipan Kundu, Brian Adams, and Linda F. Nazar
University of Waterloo, Department of Chemistry, 200 University Avenue west, Waterloo, Ontario, Canada, N2L3G1.

11:50 I-1_7/O
An aqueous rechargeable Zn//Co_3O_4 battery with improved electrochemical performance
Lijun Fu, Yusong Zhu, Yuping Wu
College of Energy Science and Engineering, Nanjing Tech University, No. 30 Puzhu Road (S), Nanjing 211800, Jiangsu Province, China.

12:10 I-1_8/O
The Stability of K-Beta" Alumina in Aqueous Solutions
Geoff McConohy, Antonio Baclig, William C. Chueh
Stanford University, Department of Materials Science, 496 Lomita Dr. Stanford, CA, 94305, United States of America.

12:30 LUNCH

I-1/3

Chairmen: Maximilian Fichtner, Corsin Battaglia

14:20 I-1_9/I
Development of Fluoride Ion Conductors for Fluoride Ion Batteries
Anji Reddy Munnangi
Helmholtz Institute Ulm (HIU), Helmholtzstr. 11, 89081 Ulm, Germany.

14:45 I-1_10/O
Anion conductors- new materials for chloride and fluoride ion batteries
Fabienne Gschwindr, Franziska Klein
Helmholtz Institute Ulm, Helmholtzstrasse 11 89081 Ulm, Germany.

15:05 I-1_11/O
Material engineering towards stable and active interface for high performance lithium-oxygen cells
Zhonghui Cui, Peili Lou, Xiangxin Guo
Shanghai Institute of Ceramics, Chinese Academy of Sciences, 1295 DingXi Road, Shanghai 200050, P.R. China.

15:25 I-1_12/O
Unravelling the Interplay between Particle Size, Defect Concentration and Lithium Ion Transport in $LiFePO_4$
Sevi Murugavel
Department of Physics and Astrophysics, University of Delhi, Delhi-110007 India.

15:45 BREAK

I-1/4

Chairmen: Maximilian Fichtner, Corsin Battaglia

16:15 I-1_13/I
Electronic and ionic conductivity of nanocrystalline sodium peroxide
Martin Philipp[a,b], Sarah Lunghammer[a,b], Ilie Hanzu[a,b,c], and Martin Wilkening[a,b,c]
[a] Christian Doppler Laboratory for Lithium Batteries, and Institute for Chemistry and Technology of Materials, Graz University of Technology (NAWI Graz), Stremayrgasse 9, 8010 Graz, Austria. [b] DFG Research Unit "Mobility of Lithium Ions in Solids", Graz University of Technology, Stremayrgasse 9, 8010 Graz, Austria. [c] Alistore-ERI European Research Institute, 33 rue Saint Leu, 80039 Amiens, France.

16:40 I-1_14/O
Molecular Origin of Capacity Fade in Sodium Ion Batteries
Lauren E. Marbella, Kent J. Griffith, Clare P. Grey
Department of Chemistry, University of Cambridge, Lensfield Road, Cambridge CB2 1EW, United Kingdom.

17:00 I-1_15/O
Structure and Sodium Ion Dynamics in Sodium Strontium Silicate
Kenneth K. Inglis[a], John P. Corley[a], Pierre Florian[b], Jordi Cabana[c], Ryan Bayliss[c,d] Frédéric Blanc[a]
[a] Department of Chemistry, Stephenson Institute for Renewable Energy, University of Liverpool, UK. [b] CNRS Orléans, France. [c] Department of Chemistry, University of Illinois at Chicago, UK. [d] Department of Chemistry, University of Oxford, UK.

17:20 I-1_16/O
A highly stable closo-borate solid-state electrolyte for all-solid-state sodium-ion batteries
Léo Duchêne[a,b], Ruben-Simon Kühnel[a], Daniel Rentsch[a], Arndt Remhof[a], Hans Hagemann[b], Corsin Battaglia[a]
[a] Empa, Swiss Federal Laboratories for Materials Science and Technology, 8600 Dübendorf, Switzerland. [b] Département de Chimie Physique, Université de Genève, 1211 Geneva 4, Switzerland.

I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS

B. Fiore di Botta

Room B7

I-2/4

Chairmen: Margret Wohlfahrt-Mehrens, Stefano Passerini

9:00 I-2_13/K
Atomic-Scale Insights into Lithium and Sodium Battery Materials: Diffusion, Redox and Surface Properties
M. Saiful Islam
Department of Chemistry, University of Bath, Bath BA2 7AY, UK.

9:30 I-2_14/O
Enhanced overcharged and overheat stability of $Li(Ni_{0.8}Co_{0.15}Al_{0.05})O_2$ cathode material coated with CeO_2-Al_2O_3
Pengfei Wang, Qing Xia, Yuxing Xu, Qiangqiang Tan
State Key Laboratory of Multiphase Complex Systems, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100190, China.

9:50 I-2_15/O
Enhancing Performance of $LiFePO_4$ by Coconut Coir Dust Graphene
Evvy Kartini[a], Cipto P.Supriadi[b], Hersandy D.Kusuma[b], Wagiyo Honggowiranto[a]
[a] Center for Science and Technology for Advanced Materials, National Nuclear Energy Agency, South Tangerang 15314, Indonesia. [b] Nuclear Politechnique Institute, National Nuclear Energy Agency, Yogyakarta, Indonesia.

10:10 I-2_16/O
Investigation of Oxygen Loss Behavior of Li-rich Li-Mn-Ni-O Cathodes by Electrochemical Titration Method
Hongze Gao[a], Takashi Nakamura[b], Yuta Kimura[b], Koji Amezawa[b]
[a] Graduate School of Engineering, Tohoku University, 6-6-01, Aramaki Aza Aoba, Aoba-ku, Sendai, 980-8579, Japan. [b] Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai 980-8577, Japan.

10:30 BREAK

I-2/5

Chairmen: Christian Masquelier, Stefano Passerini

11:00 I-2_17/I
Manganese-based layered oxides as promising positive electrodes for sodium ion batteries
Nicholas E. Drewett[a], Elena Gonzalo[a], Nagore Ortiz-Vitoriano[a,b], Teófilo Rojo[a,c]
[a] CIC EnergiGUNE, Albert Einstein 48, 01510, Miñano, Spain. [b] IKERBASQUE, Basque Foundation for Science, 48013 Bilbao, Spain. (c) Dept. Química Inorgánica, Facc. Ciencia y Tecnología, Universidad del País Vasco (UPV/EHU) Barrio Sarriena s/n, 48940 Leioa - Bizkaia, Spain.

11:25 I-2_18/O
A zero-strain disordered 3.9V-$LiFeSO_4F$ as the cathode material for long term Li ion battery
Min kyu Kim, Byoungwoo Kang
Pohang University of Science and Technology(POSTECH), Department of Materials Science and Engineering, 77 Cheongam-Ro, Nam-gu, Pohang, Gyungbuk, Korea(South).

11:45 I-2_19/O
Development of water based $LiFePO_4$ and $LiFe_xMn_{1-x}PO_4$ positive electrodes
Willy Porcher[a], Elise Gutel[a], Sophie Chazelle[a], Arianna Moretti[b], Stefano Passerini[b], Iraxte de Meatza[c]
[a] CEA Liten - 17 Avenue des Martyrs, 38054 Grenoble cedex 9, France. [b] Helmholtz Institute Ulm KIT – Helmholtzstrasse 11, 89081 Ulm, Germany. [c] IK4-CIDETEC - Parque Tecnológico de San Sebastián, Paseo Miramón 196, 20014 Donostia-San Sebastián, Spain.

12:05 I-2_20/O
The nature of structural changes in Li_2MnSiO_4 cathode material during electrochemical reaction
Michał Świętosławski[a], Marta Gajewska[b], Marcelina Lis[a], Krystian Chudzik[a], Marcin Molenda[a]
[a] Jagiellonian University, Faculty of Chemistry, Ingardena 3, 30-060 Kraków, Poland. [b] AGH University of Science and Technology, Academic Centre for Materials and Nanotechnology, Mickiewicza 30, 30-059 Kraków, Poland.

12:25 I-2_21/O
Li-ion electrode nanocomposites with self-assembled conductive carbon layers
Marcin Molenda, Andrzej Kochanowski, Michał Świętosławski, Joanna Świder, Agnieszka Chojnacka
Jagiellonian University, Faculty of Chemistry, Ingardena 3 Str., 30-060 Kraków, Poland.

12:45 LUNCH

I-2/6

Chairmen: Teofilo Rojo, Cristina Tealdi

14:20 I-2_22/I
Phase transformations in recent intercalation electrode materials induced by electrostatic effects
M. Elena Arroyo-de Dompablo
Malta Consolider Team, Departamento de Química Inorgánica, Facultad de Ciencias Químicas, Universidad Complutense de Madrid, 28040-Madrid (Spain).

14:45 I-2_23/O
A Combined Multinuclear NMR and Ab Initio Investigation of Phosphorus Anodes for High-Energy Lithium and Sodium Batteries
Kent J. Griffith[a], Martin Mayo[b], Andrew J. Morris[b], Clare P. Grey[a]
[a] University of Cambridge, Department of Chemistry, Lensfield Road CB2 1EW, United Kingdom. [b] University of Cambridge, Cavendish Laboratory, J. J. Thomson Avenue, Cambridge CB3 0HE, United Kingdom.

15:05 I-2_24/O
Synthesis and Stabilization of Crystalline Nanostructured Silicon for Highly Reversible Lithium Ion Storage
Dragoljub Vrankovic, Malin Becker, Magdalena Graczyk-Zajac, Ralf Riedel
Technische Universität Darmstadt, Jovanka-Bontschits-Str. 2, 64287 Darmstadt, Germany.

15:25 I-2_25/O
Selective Ionic Transport and the Interplay of Structural Defects in Battery Electrodes
Reza Shahbazian-Yassar
University of Illinois at Chicago, Department of Mechanical Engineering, Chicago, IL 60616, USA.

15:45 BREAK

I-2/7

Chairmen: Saiful Islam, Craig A. J. Fisher

16:15 I-2_26/I
Local Structures of Sodium Electrode Materials: NMR and PDF Studies
Joshua M. Stratford, Phoebe K. Allan, Oliver Pecher, Raphaele Clement, Clare P. Grey
University of Cambridge, Department of Chemistry, Lensfield Road, CB2 1EW, UK.

16:40 I-2_27/O
Artificial Solid Electrolyte Interphase on Lithium Metal Surfaces
Markus S. Ding[a,b], Stephan L. Koch[a,b], Stefano Passerini[a,b]
[a] Helmholtz Institute Ulm (HIU), Helmholtzstrasse 11, 89081 Ulm, Germany. [b] Karlsruhe Institute of Technology (KIT), P.O.Box 3640, 76021 Karlsruhe, Germany.

17:00 I-2_28/O
A comprehensive study of a film maturation process for improving the cycle life of silicon-based anodes
Cuau Reale Hernandez,[a] Zouina Karkar,[a,b] Alix Tranchot,[a] Aurélien Etiemble,[c] Eric Maire,[c] Dominique Guyomard,[b] Bernard Lestriez,[b] Lionel Roué[a]
[a] INRS- Energie, Matériaux et Télécommunications, Varennes (QC), Canada. [b] IMN, CNRS, Université de Nantes, Nantes, France. [c] MATEIS, CNRS, INSA Lyon, Université de Lyon, Villeurbanne, France.

17:20 I-2_29/O
Silicon-based anode materials for lithium-ion batteries
E. Yu. Evschik, A.V. Levchenko, Yu. A. Dobrovolsky
Institute of Problems of Chemical Physics RAS, Acad. Semenov av. 1, Chernogolovka 142432, Russian Federation.

17:40 I-2_30/O
Investigation on the Core-Shell Structure Stability of Silicon/Carbon Composites for Lithium Storage
Jun Yang, Jinghui Zhu, Yitian Bie
Shanghai Jiao Tong University, School of Chemistry and Chemical Engineering, 800 Dong Chuan Road, Shanghai, China.

I-3 – ALL SOLID-STATE BATTERIES

B. Fiore di Botta

Room B1

I-3/5: **LLZO Session 1**

Chairmen: Jennifer Rupp, Etric Wachsman

9:30 I-3_18/I
$Li_7La_3Zr_2O_{12}$-based garnet Li ion conductors as electrolytes in solid-state batteries – opportunities and challenges
Sven Uhlenbruck[a,b], Christian Dellen[a], Sandra Lobe[a], Sören Möller[a], Chih-Long Tsai[a], Anna Windmüller[a], Martin Finsterbusch[a,b], Martin Bram[a], Olivier Guillon[a-c]
[a] Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research (IEK), 52425 Jülich, Germany. [b] Helmholtz Institute Münster: Ionics in Energy Storage (IEK-12), 52425 Jülich, Germany. [c] Jülich Aachen Research Alliance: JARA-Energy.

9:55 I-3_19/O
Solid Electrolytes: Extremely Fast Charge Carriers in Garnet-Type $Li_6La_3ZrTaO_{12}$ Single Crystals
Bernhard Stanje[a,b], Stefan Breuer[a,b], Marlena Uitz[a,b], Daniel Rettenwander[c], Stefan Berendts[d], Martin Lerch[d], Reinhard Uecker[e], Günther Redhammer[c], Ilie Hanzu[a,b,f], and Martin Wilkening[a,b,f]
[a] Christian Doppler Laboratory for Lithium Batteries, and Institute for Chemistry and Technology of Materials, Graz University of Technology, Stremayrgasse 9, 8010 Graz, Austria. [b] DFG Research Unit "Mobility of Lithium Ions in Solids", Graz University of Technology, Stremayrgasse 9, 8010 Graz, Austria. [c] Department of Materials Research and Physics, University of Salzburg, 5020 Salzburg, Austria. [d] Technische Universität Berlin, Institut für Chemie, Straße des 17. Juni 135, 10623 Berlin, Germany. [e] Leibniz Institute for Crystal Growth (Forschungsverbund Berlin e.V.), Max-Born-Straße 2, 12489 Berlin, Germany. [f] Alistore-ERI European Research Institute, 33 rue Saint Leu, 80039 Amiens, France.

10:15 I-3_20/O
Proton Exchange and Transport Properties in Garnet Electrolytes
Rowena Brugge[a], Richard Chater[a], William Manalastas[b], Ola Hekselman[a], John Kilner[a,b], Ainara Aguadero[a]
[a] Imperial College London, Department of Materials, Exhibition Road, London SW7 2AZ, United Kingdom. [b] CIC Energigune, Parque Tecnológico, C/Albert Einstein, 48, 01510 Miñano, Spain.

10:35 BREAK

I-3/6: **LLZO Session 2**

Chairmen: Jennifer Rupp, Etric Wachsman

11:00 I-3_21/I
Degradation processes and ionic transport in garnet-based solid electrolytes
R. Brugge[a], A. Cavallaro[a], O. Hekselman[a], F. M. Pesci[a], J. Kilner[a, b] and A. Aguadero[a]
[a] Imperial College London, Department of Materials, Exhibition Road, London SW7 2AZ, United Kingdom. [b] CIC Energigune, Parque Tecnológico, C/Albert Einstein, 48, 01510 Miñano, Spain.

11:25 I-3_22/O
Lattice Distortion and Ionic Conduction in Garnet-type Solid Electrolyte
Hirotoshi Yamada, Rajendra Hongahally Basappa, Tomoko Ito
Nagasaki University, Graduate School of Engineering, Nagasaki 8528521, Japan.

11:45 I-3_23/O
Spatially resolved electrochemical characterization and chemical analysis of $Li_{6.4}Al_{0.2}La_3Zr_2O_{12}$ garnets
Stefanie Taibl[a], Andreas Wachter-Welzl[a], Reinhard Wagner[b], Daniel Rettenwander[c], Stefan Smetaczek[a], Andreas Limbeck[a], Georg Amthauer[b], Jürgen Fleig[a]
[a]Vienna University of Technology, Institute of Chemical Technologies and Analytics, 1060 Vienna, Austria. [b] University of Salzburg, Department of Chemistry and Physics of Materials, 5020 Salzburg, Austria. [c] Massachusetts Institute of Technology, Department of Materials Science and Engineering, 77 Massachusetts Avenue, Cambridge, MA 02139, USA.

12:05 I-3_24/O
Quantifying Lattice Geometry Correlation Effects in Garnet Solid Electrolytes
Benjamin J. Morgan
[a] Department of Chemistry, University of Bath, Claverton Down, BA2 7AY, UK.

12:25 I-3_25/O
Investigation of $Li_7La_3Zr_2O_{12}$-PEO composite electrolytes for solid-state batteries
Frederieke Langer[a], Ingo Bardenhagen[a,b], Jens Glenneberg[a], Robert Kun[a,b,c]
[a] University of Bremen, ISFM Research Group, Badgasteiner Str. 1, 28359 Bremen, Germany. [b] Fraunhofer IFAM, Wiener Str. 12, 28359 Bremen, Germany. [c] University of Bremen, MAPEX Center for Materials and Processes, Bibliothekstr. 1, 28359 Bremen, Germany.

12:45 LUNCH

I-3/7: SS Electrolyte Session 1

Chairmen: Yang Shao Horn, Michal Struzik

14:20 I-3_26/I
Structure-property relationships of single crystalline Li/Na-ion conducting solid electrolytes
Daniel Rettenwander
Center for Materials Science and Engineering, Massachusetts Institute of Technology (MIT), Cambridge, MA, 02139, USA.

14:45 I-3_27/O
Electrochemical Properties of the $Li_{6.75}La_3Zr_{1.75}Nb_{0.25}O_{12}$ Crystals/Li_3BO_3 Glass Hybrid Electrolytes
Nobuyuki Zettsu[a,b], Dae-wook Kim[b], Sakina Kaneko[b], and Katsuya Teshima[a,b]
[a] Center for Energy & Environmental Science, Shinshu University, 4-17-1 Wakasato, Nagano 380-8553, Japan. [b] Department of Materials Chemistry, Faculty of Engineering, Shinshu University, 4-17-1 Wakasato, Nagano 380-8553, Japan.

15:05 I-3_28/O
Structure Dependence on Reduction Stability of Inorganic Li Solid Electrolytes from (La,Li)TiO_3 Perovskite to $Li_7La_3Zr_2O_{12}$ Garnet
Kuan-Zong Fung, Chung-Ta Ni, Shu-Yi Tsai
National Cheng Kung University, Department of Materials Science and Engineering, No.1, University Rd., East Dist., Tainan city, Taiwan 70101.

15:25 I-3_29/O
Atomic Layer Deposition of Lithium Tantalate on Li_6PS_5Cl Solid-State Electrolyte for lithium ion batteries
P.R. Rayavarapu, S. Adams
Department of Materials Science and Engineering, National University of Singapore, Singapore-117575, Singapore.

15:45 I-3_30/O
Structural details of A-site substitution in LLTO perovskites. The importance of the amount and vacancy distribution on transport properties.
W. Bucheli[a], R. Jimenez[a], J. Sanz[a], M.E. Sotomayor[b] T. Duran[b], A. Várez[b].
[a] Instituto de Ciencia de Materiales de Madrid, CSIC, 28049 Cantoblanco, Spain. [b] Departamento de Ciencia e Ingeniería de Materiales, Universidad Carlos III de Madrid, Avda. Universidad, 3028911 Leganés, Spain.

16:05 BREAK

I-3/8: **SSElectrolyte Session 2**

Chairmen: Yang Shao Horn, Michal Struzik

16:20 I-3_31/I
Atomic Level Analysis of Defects and Ion Conductivity in Solid Electrolytes for Li-Ion Batteries
Craig A.J. Fisher[a], Xiaobing Hu[a], Shunsuke Kobayashi[a], Yumi H. Ikuhara[a], Yasuyuki Fujiwara[b], Keigo Hoshikawa[b], Akihide Kuwabara[a], Hiroki Moriwake[a], Keiichi Kohama[c], Hideki Iba[c], Yuichi Ikuhara[a,d]
[a] Nanostructures Research Laboratory, Japan Fine Ceramics Center, 2-4-1 Mutsuno, Atsuta-ku, Nagoya 456-8587, Japan. [b] Faculty of Engineering, Shinshu University, Nagano 380-8553, Japan. [c] Battery Materials

Division, Toyota Motor Corporation, Shizuoka 410-1193, Japan. [d] Institute of Engineering Innovation, The University of Tokyo, Tokyo 113-8586, Japan.

16:45 I-3_32/O
Solid Lithium Electrolytes: Strain Effects in Spinel Structured $MgAl_2O_4$
Conn O'Rourke, Benjamin Morgan
Chemistry Department, University of Bath, Claverton Down, Bath BA2 7AY.

17:05 I-3_33/O
$Li_7La_3Zr_2O_{12}$ Solid Electrolyte: Dual Substitution Strategy and Implementation in Li Metal Batteries
Buannic Lucienne[a], Aguesse Frédéric[a], Lopez del Amo Juan-Miguel[a], Orayech Brahim[a], Carrasco Javier[a], Katcho Nebil A.[a], Zhang Wei[a,b], Kilner John[a c], and Llordés Anna[a,b]
[a] CIC Energigune, Parque Tecnológico de Alava, 01510 Miñano, Spain. [b] IKERBASQUE, The Basque Foundation for Science, Bilbao, Spain. [c] Department of Materials, Imperial College London, SW7 2AZ, London, UK.

17:25 I-3_34/O
Synthesis and Electrical Properties of $La_{2/3-x/3}Na_xZrO_3$ with Perovskite Structure
Katsuro Hayashi, Naoto Toyomura, George Hasegawa, Miki Inada, Naoya Enomoto
Kyushu University, Department of Applied Chemistry, Fukuoka 819-0395, Japan.

17:45 I-3_35/O
On the chemistry and electrochemistry of LiPON breakdown
Brecht Put[a, b], Philippe M. Vereecken[a, c], Andre Stesmans[b]
[a] Imec, Kapeldreef 75, 3001 Leuven, Belgium. [b] Department of Physics, Celestijnenlaan 200D, University of Leuven, 3001 Leuven, Belgium. [c] Centre for Surface Chemistry and Catalysis, University of Leuven, Kasteelpark Arenberg 23, 3001 Leuven, Belgium.

I-4 – IONICS IN "OPEN" BATTERIES (REDOX FLOW BATTERIES)

B. Fiore di Botta

Room B3

I-4/1

Chairman: Massimo Guarnieri

9:00 I-4_1/I
Polymer-based Aqueous Redox Flow Batteries
Ulrich S. Schubert
Center for Energy and Environmental Chemistry Jena (CEEC Jena) Friedrich Schiller University Jena, Jena, Germany.

9:25 I-4_2/I
Materials and chemistry development for novel redox flow batteries
Wei Wang
Pacific Northwest National Laboratory, 902 Battelle Blvd, Richland, WA 99354, USA.

9:50 I-4_3/I
Macromolecular Design Strategies for Crossover-Free, Non-Aqueous, All-Organic, Redox-Flow Batteries
Brett Helms
Lawrence Berkeley National Laboratory, The Molecular FoundryAddress1 Cyclotron Road, Berkeley, CA 94720 USA.

10:15 I-4_4/O
Poly(phenylene sulfide sulfone) based membranes for redox flow battery applications
Mario Branchi, Matteo Gigli, Barbara Mecheri, Alessandra D'Epifanio, Silvia Licoccia
Department of Chemical Science and Technologies, University of Rome Tor Vergata, Via della Ricerca Scientifica 1, 00133 Roma (Italy).

10:35 BREAK

I-4/2

Chairman: Silvia Licoccia

11:00 I-4_5/I
Towards Low Resistance Nonaqueous Redox Flow Batteries
Jarrod Milshtein[a,b], John Barton[a,c], Thomas Carney[a,b], Robert Darling[a,d], Fikile Brushett[a,c]
[a] Joint Center for Energy Storage Research, USA. [b] Massachusetts Institute of Technology, Department of Materials Science and Engineering, 77 Massachusetts Avenue, Cambridge, MA 02139, USA. [c] Massachusetts Institute of Technology, Department of Chemical Engineering, 77 Massachusetts Avenue, Cambridge, MA 02139, USA. [d] United Technologies Research Center, 411 Silver Lane, East Hartford, CT 06118, USA.

11:25 I-4_6/O (Changed with I-4_21/I)
Ion Conducting Membranes for Flow Battery Application
Xianfeng Li, Huamin Zhang
Division of Energy Storage, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, 457 Zhongshan Road, Dalian 116023 (P. R. China).

11:45 I-4_7/O
Permselectivity and Transport of Membranes for Redox Flow Batteries
Andreas Münchinger, Torben Saatkamp, Jan-Patrick Melchior, Klaus-Dieter Kreuer
Max Planck Institute for Solid State Research, Heisenbergstr. 1, 70569 Stuttgart, Germany.

12:05 I-4_8/O
Sulfonated PEEK membranes as separators for alkaline redox flow batteries: Insights from cell performance and membrane stability tests
Diana De Porcellinis[a,c], Barbara Mecheri[a], Alessandra D'Epifanio[a], Silvia Licoccia[a], Sergio Granados-Focil[b], Michael J. Aziz[c]
[a] University of Rome Tor Vergata, Department of Chemical Science and Technology, Rome, Italy. [b] Clark University, Gustaf Carlson School of Chemistry and Biochemistry, Worcester, MA, 01610, USA. [c] Harvard University, John A. Paulson School of Engineering and Applied Sciences, Cambridge, MA 02138, USA.

12:25 LUNCH

I-4/3

Chairman: Jusef Hassoun

14:20 I-4_9/I
Carbon felt electrodes in all-V redox flow batteries – can degradation be prevented?
Igor Derr, Abdulmonem Fetyan, Konstantin Schutjajew, Jakob Schweer, Jonathan Schneider, Maike Schnucklake, Christina Roth
Chemistry and Biochemistry, Freie Universität Berlin, Takustr. 3, D-14195 Berlin, Germany.

14:45 I-4_10/O
Study of transport in a novel, heteropoly acid hybrid polymer membrane designed for use in flow batteries
Andrew R. Motz[a], Mei-Chen Kuo[a], Ahmet Kusoglu[b], Michael C. Tucker[b], Adam Z. Weber[b], Gregory M. Haugen[c], Steven J. Hamrock[c], Andrew M. Herring[a]
[a] Colorado School of Mines, Chemical and Biological Engineering, 1613 Illinois St., Golden, Colorado 80401, United States. [b] Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division, 1 Cyclotron Rd, Berkeley, CA 94720, United States. [c] 3M, Energy Components Program, 3M Center 201, St. Paul, MN 55144, United States.

15:05 I-4_11/O
High Energy Density Redox Targeting Based Flow Batteries
Chuankun Jia, Yun Guang Zhu, Qing Wang
Department of Materials Science and Engineering, Faculty of Engineering, National University of Singapore, 117576, Singapore.

15:25 I-4_12/O
Aqueous Organic Redox Flow Batteries for Large-Scale Energy Storage
Lena Hoober-Burkhardt, Bo Yang, Sankarganesh Krishnamoorthy, Advaith Murali, Archith Nirmalchandar, Surya Prakash, S. R. Narayanan
University of Southern California, Department of Chemistry, 837 Bloom Walk, LHI 101, Los Angeles, CA, 90089, USA.

15:45 BREAK

I-4/4

Chairman: Thomas Zawodzinski

16:15 I-4_13/I
Mass Transport in Electrolytes and Electrodes for Redox Flow Batteries
Gabriel Goenaga[1], Nelly Cantillo Cuello[2], Jing Peng[1], Zhijiang Tang[3] and Thomas A. Zawodzinski[4]
[1] Department of Chemical and Biomolecular Engineering, University of Tennessee-Knoxville, 409 SERF, Knoxville, TN 37996. [2] Department of Chemical and Biomolecular Engineering, University of Tennessee-Knoxville, 109A SERF, Knoxville, TN 37996. [3] Department of Physical Chemistry of Materials, ORNL, G156, Bldg. 4500S, Oak Ridge National Laboratory, Oak Ridge TN. [4] Department of Chemical and Biomolecular Engineering, University of Tennessee-Knoxville, 411 SERF, Knoxville, TN 37996.

16:40 I-4_14/I
Controlled Morphology and Surface Chemistry of Nanoporous Membranes for VRFB
Tomoko Fujiwara[(a)], Brandon P. Gindt[(a)], Zhijiang Tang[(b)], Thomas A. Zawodzinski[(c)]
[(a)] University of Memphis, Department of Chemistry, 213 Smith Chemistry Bldg, Memphis, TN 38152, USA. [(b)] Oak Ridge National Laboratory, Materials Science and Technology Division, Oak Ridge, TN 37831, USA. [(c)] University of Tennessee-Knoxville, Department of Chemical and Biomolecular Engineering, Knoxville, TN 37996, USA.

17:05 I-4_15/O
Metal-based non-aqueous redox flow batteries with highly soluble active species and improved performance
Yun Li[(a)], Koen Binnemans[(b)], Jan Fransaer[(c)], Ivo F. J. Vankelecom[(a)]
[(a)] Centre for Surface Chemistry and Catalysis, KU Leuven, Celestijnenlaan 200F, P.O. Box 2461, 3001 Heverlee, Belgium. [(b)] Department of Chemistry, KU Leuven, Celestijnenlaan 200F, P.O. Box 2404, 3001, Heverlee, Belgium. [(c)] Department of Materials Engineering, KU Leuven, Kasteelpark Arenberg 44, P.O. Box 2450, 3001 Heverlee, Belgium.

17:25 I-4_16/O
Modeling and experimental analysis of mass transport phenomena in Vanadium Redox Flow Batteries
M. Zago, M. Messaggi, C. Rabissi, A. Baricci, R. Mereu, F. Inzoli, A. Casalegno
Politecnico di Milano, Department of Energy, Via Lambruschini 4, 20156, Milan, Italy.

17:45 I-4_17/O
Lattice-Boltzmann and Lagrange Particle Tracking methods based on porous medium X-ray Computed Tomography for analyzing fluid dispersion in Flow Battery electrodes
D. Maggiolo[a], A. Trovò[b], F. Picano[b], F. Zanini[b], S. Carmignato[c], M. Guarnieri[b]
[(a)] Dept. Industrial Engineering, University of Padua, via Gradenigo 6/a, 35131 Padova (PD), Italy. [(b)] Dept. Management and Engineering, University of Padua, Str. San Nicola 3, Vicenza (VI), Italy.

I-7 – "POLYMER ELECTROLYTES" - THE UBIQUITY OF IONS AND POLYMER MATERIALS IN DEVICES

B. Fiore di Botta

Room B9

I-7/1

Chairman: Yoichi Tominaga

9:00 I-7_1/I
Salt based solid-state composite electrolytes: addition of nanomaterials and the role of alkali salt concentration
Patrick C. Howlett [a], George W. Greene[a], Maria Forsyth[a], Jennifer M. Pringle[a] Michel Armand[b]
[(a)] Australian Centre of Excellence for Electromaterials Science and Institute for Frontier Materials, Deakin University, Victoria, Australia 3125 [(b)] CIC Energigune, Albert Einstein 48, 01510 Vitoria-Gasteiz (Basque Country)

9:25 I-7_2/I
Ion Behavior in Materials for Redox Flow Batteries
Jing Peng [(a)], Kun Lou [(a)], Gabriel Goenaga [(b)], Zhijiang Tang [(c)] and Thomas A. Zawodzinski [(d)]
[(a)] Department of Chemical and Biomolecular Engineering, University of Tennessee-Knoxville, 109A SERF, Knoxville, TN 37996. [(b)] Department of Chemical and Biomolecular Engineering, University of Tennessee-Knoxville, 409 SERF, Knoxville, TN 37996. [(c)] Department of Physical Chemistry of Materials, ORNL, G156, Bldg. 4500S, Oak Ridge National Laboratory, Oak Ridge TN. [(d)] Department of Chemical and Biomolecular Engineering, University of Tennessee-Knoxville, 411 SERF, Knoxville, TN 37996.

9:50 I-7_3/I
Polymer Membranes for Large-Scale Energy Conversion and Storage
Michael A. Hickner
Department of Materials Science and Engineering, The Pennsylvania State University, University Park, PA 16802, USA.

10:15 I-7_4/O
Towards Aging Resistant Lithium Polymer Batteries for Safe Wide Temperature Applications
Jijeesh R. Nair[(a)], Luca Porcarelli[(a)†], Marisa Falco[(a)], Federico Bella[(a)], Francesca Colò[(a)], Giuseppina Meligrana[(a)], Rongying Lin[(b)], Giovanni B. Appetecchi[(c)], Stefano Passerini[(d)], Claudio Gerbaldi[(a)]
[(a)] GAME Lab, Dept. Applied Science and Technology, Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Torino, Italy. [(b)] Solvionic SA, Site Bioparc Sanofi, route d'Espagne 195, BP1169, 31036 Toulouse, France. [(c)] ENEA, Agency for New Technologies, Energy and Sustainable Economic Development, UTRINN-IFC, via Anguillarese 301, Rome, Italy. [(d)] Karlsruhe Institute of Technology (KIT), PO Box 3640, 76021 Karlsruhe, Germany. † now at POLYMAT, Univ. Basque Country UPV/EHU, San Sebastian, Spain.

10:35 BREAK

I-7/2

Chairman: Jelena Popovic

11:00 I-7_5/I
Dynamics of charge carriers in PMMA-based polymer electrolytes embedded with ionic liquid
A. Ghosh, P. Pal
Department of Solid State Physics, Indian Association for the Cultivation of Science, Jadavpur, Kolkata-700032, India.

11:25 I-7_6/I
Entrapment of Ionic Liquids in Mesoporous Materials and Polymeric Membranes and its Applications in Electrochemical Devices
Rajendra Kumar Singh
Department of Physics, Banaras Hindu University, Varanasi 221005, India.

11:50 I-7_7/O
Influence of Chemical Structure on Tg and Conductivity of Polymerized Ionic Liquids
Vera Bocharova [(a)], Zaneta Wojnarowska [(a)], Vladimir N. Novikov [(b)], Alexei P. Sokolov [(a, b)]
[(a)] Chemical Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA. [(b)] Department of Chemistry, University of Tennessee, Knoxville, TN 37996, USA.

12:10 I-7_8/O
Charge transport and glassy dynamics in high conductive Polymeric Ionic Liquids (PIL)
Falk Frenzel [(a)], Ryan Guterman [(b)], A. Markus Anton [(a)], Jiayin Yuan [(b)], Friedrich Kremer [(a)]
[(a)] Leipzig University, Peter Debye Institute for Soft Matter Physics, Linnèstrasse 5, 04103 Leipzig, Germany. [(b)] Max Planck Institute of Colloids and Interfaces, Department of Colloid Chemistry, Am Mühlenberg 1 OT Golm, 14424 Potsdam, Germany
16) 115-129.

12:30 LUNCH

I-7/3

Chairman: Steve Greenbaum

14:20 I-7_9/I
Ion Conductive Polymer Nanofiber Framework for All-Solid-State Lithium Ion Battery
Manabu Tanaka [a, b], Tsukasa Watanabe [a], Hiroyoshi Kawakami [a, b]
[a] Department of Applied Chemistry. [b] Research Center for Hydrogen Energy-Based Society, Tokyo Metropolitan University, Hachioji, Tokyo, 192-0397 Japan.

14:45 I-7_10/O
Ionic Conductivity, SEM and TGA studies of nano-dispersed silica based polymer gel electrolytes containing $LiBF_4$
Narinder Arora[a], Simranjit Singh[a], Rajiv Kumar[b], Rajesh Kumar[a], Anita Kumari[a]
[a] P.G. Department of Physics, D.A.V. College, Amritsar -143 001, Punjab, India. [b]Department of Physics, G.G.D.S.D. College, Hariana, Hoshiarpur - 144 208, Punjab, India.

15:05 I-7_11/O
Electrochemical Properties and Ionic Conducting Behavior of Silicon Dioxide and Hydrochloric Acid Modified Silicon Dioxide Filled Polymethyl Methacrylate/50% Epoxidized Natural Rubber Electrolytes
Sharil Fadli Mohamad Zamri [a, c], Famiza Abdul Latif [a, c], Ruhani Ibrahim [a] and Ab Malik Marwan Ali [b]
[a] School of Chemistry and Environment, Faculty of Applied Sciences, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia. [b] School of Physics and Material Studies, Faculty of Applied Sciences, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia. [c] Synthesis and Application of Conducting Polymer Research Group, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia.

15:25 I-7_12/O
TiO_2-embedded perfluorinated ionomeric multilayer for abatement of water soluble organic pollutants
Maurizio Sansotera [a, b], Federico Persico [a, b], Alberto Baggioli [a, b], Maria Vittoria Diamanti [a, b], Luca Magagnin [a, b], Walter Navarrini [a, b]
[a] Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Politecnico di Milano, Via Mancinelli 7, 20131, Milano, Italy. [b] Consorzio Interuniversitario Nazionale per la Scienza e Tecnologia dei Materiali, Via G. Giusti 9, 50121 Firenze, Italy.

15:45 BREAK

I-7/4

Chairman: Patrick Howlett

16:15 I-7_13/I
Development of Proton Conducting Fuel Cell based on Natural and Synthetic Polymers
S. Selvasekarapandian[a], S. Monisha[a,b], G. Boopathi[a,c], S. Selvalakshmi[d], S. Nithya [e]
[a] Materials Research center, Coimbatore, Tamilnadu-641045, India. [b] Research Department of Physics, N.M.S.S. Vellaichamy Nadar College, Madurai, Tamilnadu-625019, India. [c] Department of Bioenergy, Tamil Nadu Agricultural University, Tamil Nadu-641003, India. [d] Department of Physics, S.F.R. College for Women, Sivakasi, Tamil Nadu-626123, India. [e] Department of Physics, Sri S.R.N.M. College, Sattur, Tamilnadu-626203 India.

16:40 I-7_14/O
Electrodeposition of sulfonated aromatic polymers as ion conducting separator for microscale energy storage and conversion
Michele Braglia[a,c], Ivan Vito Ferrari[b,c], Maria Luisa Di Vona[b,c], Philippe Knauth[a,c]
[a] Aix Marseille University (AMU), CNRS, Madirel (UMR 7246), Electrochemistry of Materials Group, 13397 Marseille, France. [b] University of Rome Tor Vergata, Department of Industrial Engineering, (URoma2), 00173 Roma, Italy. [c] International Associated Laboratory (L.I.A.), Ionomer Materials for Energy (AMU, CNRS, URoma2).

17:00 I-7_15/O
Synthesis and characterization of sulfonated Polyethersulfones as polymer electrolytes for PEMFC devices
Valentina Sabatini [a], Saverio Latorrata [b], Hermes Farina [a], Marco Aldo Ortenzi [a], Paola Gallo Stampino [b], Giovanni Dotelli [b]
[a] University of Milan, Department of Chemistry, CRC Materials&Polymers (LaMPo), Via Golgi 19, 20133 Milan, Italy. [b] Politecnico di Milano, Department of Chemistry, Materials and Chemical Engineering "Giulio Natta", Piazza Leonardo da Vinci 32, 20133, Milan, Italy.

17:20 I-7_16/O
Solid Polymer Electrolytes with Ionic Liquids as Additives for Lithium Metal Batteries
A. Mokrini, and A. Laforgue
National Research Council Canada, Automotive and Surface Transportation 75, de Mortagne Blvd. J4B 6Y4, Boucherville (QC), Canada.

I-8 – CERAMIC PROTON AND HYDRIDE ION CONDUCTORS

A. Padova Fiere

Room A3

I-8/1

Chairmen: Rotraut Merkle, Ragnar Strandbakke

9:00 I-8_1/I
Double Perovskite Oxides as Cathodes for PCFCs
Sihyuk Choi [a] Chris J. Kucharczyk [a, b], Xiaohang Zhang [c], Yangyang Liang [c], Ichiro Takeuchi [c], and Sossina M. Haile [a, b]
[a] Materials Science and Engineering, Northwestern University, Evanston, IL, USA. [b] Applied Physics & Materials Science, California Institute of Technology, Pasadena, CA, USA. [c] Materials Science and Engineering, University of Maryland, College Park, MD, USA

9:25 I-8_2/O
Hydration and structural properties of mixed conductor $Ba_{1-x}Gd_{0.8}La_{0.2+x}Co_2O_{6-\delta}$ (BGLC)
Ragnar Strandbakke [a], Einar Vøllestad [a], Sabrina Sartori [b], Julien Lang [c], Truls Norby [a]
[a] Department of Chemistry, University of Oslo, FERMiO, Gaustadalléen 21, NO-0349 Oslo, Norway. [b] Department of Physics, University of Oslo, FERMiO, Gaustadalléen 21, NO-0349 Oslo, Norway. [c] Neutron Scattering Branch, Canadian Nuclear Laboratories, Chalk River, Ontario, Canada

9:45 I-8_3/O
Exploring Mixed Proton/Electron Conducting Air Electrode materials in Protonic Electrolysis Cells
Kwati Leonard [a], John Druce [a], Vincent Thoreton [a], John A. Kilner [a, b] Hiroshige Matsumoto [a]
[a] International Institute for Carbon Neutral Energy Research (I2CNER), Kyushu University Motooka, Nishi-ku, Fukuoka 819-0395, Japan. [b] Department of Materials, Imperial College London, London, SW7 2BP (UK)

10:05 I-8_4/O
Proton Uptake in Perovskite PCFC Cathode Materials: Effects of Cation Composition and Non-ideal Behaviour
Reihaneh Zohourian, Rotraut Merkle, Joachim Maier
Max Planck Institute for Solid State Research, Stuttgart, Germany

10:25 I-8_5/O
Application of triple conducting oxides in protonic single layer fuel cells
Krzysztof Zagórski [a], D. Szymczewska [b], S. Wachowski [a], A. Mielewczyk-Gryń [a], P. Jasiński [b], M. Gazda [a]
[a] Gdansk University of Technology, Faculty of Applied Physics and Mathematics, Department of Solid State Physics, ul. Narutowicza 11/12 80-233 Gdansk, Poland. [b] Gdansk University of Technology, Faculty of Electronics, Telecommunication and Informatics, Biomedical Engineering Department, ul. Narutowicza 11/12 80-233 Gdansk, Poland.

10:45 BREAK

I-8/2

Chairman: Sandrine Ricote

11:00 I-8_6/I
Hydrogen bonding defines proton transport in doped barium zirconates
Yoshihiro Yamazaki [a, b]
[a] INAMORI Frontier Research Center, Kyushu University, Fukuoka 819-0395, Japan. [b] Department of Materials Science and Engineering, Kyushu University, Fukuoka 819-0395, Japan.

11:25 I-8_7/O
Structures, phase fields and conductivity of Pr-substituted $BaZr_{0.7}Ce_{0.2}Y_{0.1}O_{3-\delta}$
G. Heras-Juaristi [a], U. Amador [b], D. Pérez-Coll [a], R. O. Fuentes [c], A. L. Chinelatto [d], J. Romero de Paz [e], D. P. Fagg [f], G. C. Mather [a]
[a]Instituto de Cerámica y Vidrio, CSIC, 28049 Madrid, Spain. [b]Departamento de Química, Universidad CEU-San Pablo, Boadilla del Monte 28668 Madrid, Spain. [c]Departamento de Física de la Materia Condensada, CNEA, Av. Gral. Paz 1499, Buenos Aires Argentina. [d]Departamento de Engenharia de Materiais, Universidade Estadual de Ponta Grossa, Av. Gal. Carlos Cavalcanti, 4748, 84300-900 Ponta Grossa-PR, Brazil. [e]C.A.I. Técnicas Físicas, Facultad de Ciencias Físicas, Universidad Complutense, 28040 Madrid, Spain. [f] Department of Mechanical Engineering, University of Aveiro, 3810-193 Aveiro, Portugal.

11:45 I-8_8/O
Mobility of Proton Carriers in Phosphate Glasses
Takahisa Omata [a], Takuya Yamaguchi [a, b], Satoshi Tsukuda [a], Junji Nishii [c], Toshiharu Yamashita [d], Hiroshi Kawazoe [d], Tomohiro Ishiyama [e]
[a] IMRAM, Tohoku University, Sendai, Japan. [b] Graduate School of Environmental Studies, Tohoku University, Sendai, Japan. [c] Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan. [d] Kawazoe Frontier Technologies Corporation, Yokohama, Japan. [e] National Institute of Advanced Industrial Science and Technology(AIST), Tsukuba, Japan.

12:05 I-8_9/O
Influence of sulfur doping on the low temperature proton conductivity of bulk nanograined TiO_2
Alessandro Senocrate [a], Ilenia G. Tredici [a], Michele Petrecca [b], Brunetto Cortigiani [b], Giancarla Alberti [a], Simone Angioni [a], Umberto Anselmi-Tamburini [a]
[a] University of Pavia, Department of Chemistry, V. Taramelli 12, 27100 Pavia, Italy. [b] University of Florence, Department of Chemistry, V. della Lastruccia 3, 50019 Sesto Fiorentino (Florence), Italy.

12:25 LUNCH

I-8/3

Chairman: Min Chen

14:20 I-8_10/I
Proton conduction at barium zirconate electrolyte surface using density functional theory
Yeong-Cheol Kim and Ji-Su Kim
KoreaTech, School of Energy Materials and Chemical Engineering, Cheonan, Republic of Korea.

14:45 I-8_11/O
Surface chemistry of $BaZr_{0.9}Y_{0.1}O_{3-\delta}$ and its effect on the electrochemical properties of a Ni/$BaZr_{0.9}Y_{0.1}O_{3-\delta}$ interface for Proton Ceramic Electrochemical Cells
Min Chen [a], Helena Téllez Lozano [b], John Druce [b], Hiroshige Matsumoto [b], Truls Norby [a]
[a] Centre for Materials Science and Nanotechnology (SMN), Department of Chemistry, University of Oslo, FERMiO, Gaustadalléen 21, NO-0349 Oslo, Norway. [b] International Institute for Carbon-Neutral Energy Research (I²CNER), Kyushu University, Japan.

15:05 I-8_12/O
Design of Nanostructured Solid Ionic Hydrogen Barrier Coatings: Engineering Chemistry and Space-Charges
William J. Bowman, Bilge Yildiz
Laboratory for Electrochemical Interfaces, Massachusetts Institute of Technology, Cambridge, MA, US, 02139.

15:25 I-8_13/O
Design of doped α-Alumina thin films for use as hydrogen barrier coatings using first principles methods
Vrindaa Somjit [a], Bilge Yildiz [a, b]
[a] Laboratory for Electrochemical Interfaces, Department of Materials Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Massachusetts-02139, USA. [b] Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Massachusetts-02139, USA.

15:45 BREAK

I-8/4

Chairmen: Robert Kee, Jong-Sook Lee

16:15 I-8_14/I
Synthesis and processing of materials for efficient PCFCs
Gilles Taillades
Charles Gerhardt Institute, University of Montpellier, Place E. Bataillon, 34095 Montpellier, France.

16:40 I-8_15/O
Temperature Dependence of Electrical-Transport Components and Phase Transitions in Mixed-Conducting BZCY72
Gemma Heras-Juaristi [a], Domingo Pérez-Coll [a], Ulises Amador [b], Glenn C. Mather [a]
[a] Instituto de Cerámica y Vidrio, CSIC, 28049 Madrid, Spain. [b] Departamento de Química, Facultad de Farmacia, Universidad CEU-San Pablo, Boadilla del Monte 28668 Madrid, Spain

17:00 I-8_16/O I-8-20170220-162621-C4GE-ORAL
Understanding AC Response of $SrZr_{0.95}Y_{0.05}O_3$ (SZY) Proton Conductors
Dang Thanh Nguyen [a], Eui-Chol Shin [a], Noriko Sata [b], Jong-Sook Lee [a]
[a] Chonnam National University, School of Materials Science and Engineering, Gwangju 61186, Korea. [b] German Aerospace Center (DLR), Institute of Engineering Thermodynamics, Pfaffenwaldring 38–40, 70569 Stuttgart, Germany

17:20 I-8_17/O I-8-20170222-004224-EANS-ORAL
Analysis of Electrical Conductivity Relaxation Curves of Proton Conducting Lanthanum Tungstate
Andreas Falkenstein [a, b], Manfred Martin [a, b]
[a] Institute of Physical Chemistry, RWTH Aachen University, Landoltweg 2, 52074 Aachen, Germany. [b] JARA-ENERGY.

17:40 I-8_18/O
$Ln_{5.5}WO_{11.25-\delta}$: chemical stability and transport properties under H_2S atmospheres
Sonia Escolástico [a, b], María Balaguer [a], Katja Haas-Santo [b], Roland Dittmeyer [b], Jose M. Serra [a]
[a] Instituto de Tecnología Química (Universidad Politécnica de Valencia – Consejo Superior de Investigaciones Científicas), Av. Los naranjos s/n, E-46022, Valencia, Spain. [b] Institute for Micro Process Engineering, Karlsruhe Institute of Technology, Hermann-von-Helmholtz-Platz 1, 76344, Eggenstein-Leopoldshafen, Germany.

I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS

A. Padova Fiere

Room A2

I-9/4: **Modelling Session II**

Chairman: Dane Morgan

9:00 I-9_15/I
Use of a Distribution Function of Relaxation Times (DFRT) in Impedance Analysis of SOFC Electrodes.
Bernard A. Boukamp[a], Aurélie Rolle[b]
[a] University of Twente, Fac. of Science and Technology & MESA+ Institute for Nanotechnology, P.O. Box 217, 7500 AE, Enschede, The

Netherlands. [b] Univ. Lille Nord de France, F-59000 Lille, France; CNRS UMR8181, Unité de Catalyse et Chimie du Solide, UCCS, ENSCL, Université Lille 1, F-59652 Villeneuve d'Ascq, France

9:25 I-9_16/O
Nondestructive diagnostic tool for solid oxide fuel cells
Alon Oz [a], Danny Gelman[b], Sioma Baltianski[b], Yoed Tsur[a,b]
[a] The Nancy and Stephen Grand Technion Energy Program, Technion – Israel Institute of Technology, Haifa 3200003. [b] Department of Chemical Engineering, Technion - Israel Institute of Technology, Haifa, Israel 3200003.

9:45 I-9_17/I
Computational Design of SOFC Cathode Materials with Enhanced Chemical Stability
Hyunguk Kwon, Jeong Woo Han
University of Seoul, Department of Chemical Engineering, Seoul 02504, Republic of Korea.

10:10 I-9_18/O
Atomistic modelling of A_2BO_4 materials: H_2O and CO_2 incorporation
Adam J. McSloy[a], Peter R. Slater [b], Paul Kelly, Pooja M. Panchmatia[a]
[a] Department of Chemistry, Loughborough University, Loughborough LE11 3TU, UK. [b] School of Chemistry, University of Birmingham, Birmingham B15 2TT, UK.

10:30 I-9_19/O
Linear free-energy relationship in oxygen exchange for nonstoichiometric oxides with different electronic band structures
Stanislav Chizhik, Alexander Nemudry
Institute of Solid State Chemistry and Mechanochemistry SB RAS, 630128, Novosibirsk, Russia.

10:50 BREAK

I-9/5: **SOFC Cathodes Session II**

Chairman: Ellen Ivers-Tiffée

11:00 I-9_20/I
Design of perovskite-type mixed conductors for applications in solid oxide fuel cells
Zongping Shao[a,b]
[a] Department of Chemical Engineering, Curtin University, Perth, WA 6845, Australia. [b] School of Energy Science and Engineering, Nanjing Tech University, Nanjing, 210009, China.

11:25 I-9_21/O
Engineering Active and Stable Perovskite Oxide Catalyst Surfaces with Fundamental Insight
Michael L. Machala[a], Sangchul Lee[a], Zixuan Guan[b], David N. Mueller[a], Di Chen[a], Dawei Zhang[a], Hendrik Bluhm[c], William C. Chueh [a]
[a] Materials Science and Engineering, Stanford University, 496 Lomita Mall, Stanford, CA 94305 USA. [b] Applied Physics, Stanford University, 496 Lomita Mall, Stanford, CA 94305 USA. [c] Advanced Light Source, Lawrence Berkeley National Laboratory, 6 Cyclotron Rd, Berkeley, CA 94720 USA

11:45 I-9_22/O
The oxygen surface exchange properties of $La_{0.58}Sr_{0.4}Fe_{0.8}Co_{0.2}O_{3-\delta}$ thin films
Christodoulos Chatzichristodoulou[a], Simon Pitscheider[a], Karin V. Hansen[a], Kion Norrman[a], Johan Hjelm[a], Torben Jacobsen[a], and Mogens B. Mogensen[a]
[a] Technical University of Denmark, Department of Energy Conversion and Storage, Frederiksborgvej 399, 4000 Roskilde, Denmark.

12:05 I-9_23/O
Performance of La(Co, Ni, Fe)O_3 perovskites as air-electrode materials for solid oxide cells
Qianli Ma[a,b], Frank Tietz[a,b], Norbert. H. Menzler[a,b],Olivier Guillon[a,b]
[a] Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, IEK-1, 52425 Jülich, Germany. [b] Jülich Aachen Research Alliance, JARA-Energy, 52425 Jülich, Germany.

12:25 I-9_24/O
Doped $BaFeO_{3-\delta}$ as Cobalt-free Cathode Materials for Intermediate Temperature Solid Oxide Fuel Cells
Jian Wang and Francesco Ciucci
Department of Mechanical and Aerospace Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong, China.

12:45 LUNCH

I-9/6: **Characterization Session I**

Chairman: William Chueh

14:15 I-9_25/I
In-Situ Neutron Diffraction Analysis of SOFC Electrode Materials
Steven McIntosh[a], Caterina Sarno[a,b], Alex Tomkiewicz[a], Mazin Tamimi[a], Ashfia Huq [c]
[a] Department of Chemical and Biomolecular Engineering, Lehigh University, 111 Research Drive, Bethlehem PA 18015, USA. [b] Dept. of Chemical Science and Technologies, University of Rome "Tor Vergata", Via della Ricerca Scientifica, 00133 Rome, Italy. [c] Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN, 37830, USA.

14:40 I-9_26/O
Correlating the Onset of CO Disproportionation to Surface Chemistry on Ceria
J. Wang[a], S. R. Bishop[b], Q. Lu[c], L. Sun[a], G. Vardar[a], R. Bliem[a], N. Tsvetkov[a], M. Jansen[a], J.-J. Gallet[d], F. Bournel[d], I. Waluyo[e], E. J. Crumlin[f], and B. Yildiz[a,c]
[a] Department of Nuclear Science and Engineering, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA. [b] Materials Processing Center, MIT, Cambridge, MA, USA. [c] Department of Materials Science and Engineering, MIT, Cambridge, MA, USA. [d] Synchrotron SOLEIL, Saint-Aubin, France. [e] National Synchrotron Light Source II, Brookhaven National Laboratory, Upton, NY, USA. [f] Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, USA.

15:00 I-9_27/O
In-situ Surface Analysis of SOFC Cathode Degradation using High Temperature Environmental Scanning Electron Microscopy and Electron Backscattered Diffraction
M. Niania[a], R. Podor[b], B. Britton[a], S. Skinner[a], J. Kilner[a]
[a] Imperial College London, Materials, Exhibition Road, SW7 2AZ, UK. [b] Institut de Chimie Séparative de Marcoule (ISCM), Centre de Marcoule, 30207 Bagnols Sur Ceze Cedex, France.

15:20 I-9_28/O
Progress in development of *in operando* dual-chamber NAP-HT-XPS and –XRD methods / detailed study of Ni-GDC redox behavior
Gunnar Nurk[a], Kuno Kooser[b], Ove Korjus[a], Rait Kanarbik[a], Samuli Urpelainen[c], Tanel Käämbre[d], Edwin Kukk[b], Urmas Joost[d], Margus Kodu[d] Priit Möller[a], Indrek Kivi[a], Mihkel Vestli[a], Enn Lust[a]
[a] University of Tartu, Institute of Chemistry, Ravila 14a, 50411 Tartu, Estonia. [b] University of Turku, Department of Physics and Astronomy, 20014 Turku, Finland. [c] Lund University, MAX IV Laboratory, Box 118, 22100 Lund, Sweden. [d] University of Tartu, Institute of Physics, W. Ostwald Str. 1, 50411 Tartu, Estonia.

15:40 I-9_29/O
Synthesis and characterization of the novel K_2NiF_4-type oxide $Pr_2Ni_{0.9}Co_{0.1}O_{4+\delta}$
Christian Berger, Anna Theresa Strasser, Nina Schrödl, Andreas Egger, Johannes Hofer, Edith Bucher, Werner Sitte
Montanuniversitaet Leoben, Chair of Physical Chemistry, Franz-Josef-Straße 18, Leoben, Austria.

16:00 BREAK

I-9/7: **SOFC Anodes Session II**

Chairman: Koichi Eguchi

16:15 I-9_30/I
In-situ Studying and Modifying Surface Chemistry of Perovskite-Type Electrodes under Electrochemical Operation
Alexander K. Opitz
Vienna University of Technology, Institute of Chemical Technologies.

16:40 I-9_31/O (moved to 18:00)
Microstructural and electrochemical degradation of infiltrated SOFC anodes
Antonio Bertei, Kristina Kareh, Enrique Ruiz-Trejo, Farid Tariq, Vladimir Yufit, Nigel P. Brandon
Imperial College London, Department of Earth Science and Engineering, SW7 2AZ London, UK.

17:00 I-9_32/O
Doped-$SrTiO_3$ as a redox stable anode for a metal-supported solid oxide fuel cell
Amir Masoud Dayaghi, Kun Joong Kim, Gyeong Man Choi
Fuel Cell Research Center / Department of Materials Science and Engineering, Pohang University of Science and Technology (POSTECH), Pohang 37673, Republic of Korea.

17:20 I-9_33/O
Double Perovskite $Sr_2FeMo_{0.65}Co_{0.35}O_6$ Serves as both High Performance Anode and Cathode for Quasi-Symmetrical SOFCs
Zhihong Du[a,b], Hailei Zhao[a,b], Yi Sha[a], Yang Zhang[a], Konrad Świerczek[c]
[a] School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing 100083, China. [b] The Beijing Municipal Key Laboratory of New Energy Materials and Technologies, Beijing 100083, China. [c] Faculty of Energy and Fuels, AGH University of Science and Technology, al. A. Mickiewicza 30, 30-059 Krakow, Poland.

17:40 I-9_34/O
In-situ Raman spectroscopy analysis of the interfaces between ceria containing SOFC anodes and zirconia electrolyte: effects of current variations
Dmitrii Agarkov, Ilya Burmistrov, Fedor Tsybrov, Ilya Tartakovskii, Vladislav Kharton, Sergey Bredikhin
Institute of Solid State Physics RAS, Laboratory of defect structures, 142432, 2, Ossipyana street, Chernogolovka, Moscow region, Russia.

18:00 I-9_35/O
H_2 and CO oxidation process at the three-phase boundary of Cu-ceria cermet anode for solid oxide fuel cell
Minghao Zheng, Changrong Xia, Shuang Wang, Mei Li
Key Laboratory of Materials for Energy Conversion, Chinese Academy of Sciences, Department of Materials Science and Engineering & Collaborative Innovation Center of Suzhou Nano Science and Technology, University of Science & Technology of China, No. 96 Jinzhai Road, Hefei, Anhui Province, 230026, P. R. China.

I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS

B. Fiore di Botta

Room B6

I-10/1

Chairman: Davide Barreca

9:00 I-10_1/I
2D and 3D Characterization of Multifunctional Oxide Materials down to an Atomic Scale
Gustaaf Van Tendeloo, Dmitry Batuk, Sara Bals
EMAT, University of Antwerp, Groenenborgerlaan 171, B-2020 Antwerp, Belgium.

9:25 I-10_2/O
Two-dimensional oxide nanosheets as seed layers to control crystallization, growth direction and functional properties of oxide thin films
Huiyu Yuan and Johan E. ten Elshof
MESA+ Institute for Nanotechnology, University of Twente, P.O. Box 217, 7500 AE ENschede, the Netherlands.

9:45 I-10_3/O
Analytical TEM techniques to gain new insights into chemical and structural features of co-doped perovskites
M. Meffert[a], L.-S. Unger[b], H. Störmer[a], S. F. Wagner[b], E. Ivers-Tiffée[b], D. Gerthsen[a]
[a] Karlsruhe Institute of Technology (KIT), Laboratory for Electron Microscopy (LEM), 76131, Germany. [b] Karlsruhe Institute of Technology (KIT), Institute for Applied Materials (IAM-WET), 76131, Germany.

10:05 I-10_4/O
Rapid growth of ultrathin metallic oxide nanowires by plasma afterglow-assisted oxidation
T. Gries, A. Imam, A.Altaweel, T. Belmonte
Institut Jean Lamour, CNRS, Université de Lorraine, Nancy, F-54011, France.

10:25 I-10_5/O
High Ion Flux Plasma Nanostructures for Electrochemical Applications
Anja Bieberle-Hütter [a], Rochan Sinha [a], Irem Tanyeli [a], Reinoud Lavrijsen [b], Bert Koopmans [b], Richard van de Sanden [a, c]
[a] DIFFER – Dutch Institute for Fundamental Energy Research, Department Solar Fuels, Eindhoven, the Netherlands. [b] Physics of Nanostructures and center for NanoMaterials (cNM), Department of Applied Physics, Eindhoven University of Technology (TU/e), the Netherlands. [c] Plasma and Materials Processing, Department of Applied Physics, Eindhoven University of Technology (TU/e), the Netherlands.

10:45 BREAK

I-10/2

Chairman: Juan Ramon Morante

11:00 I-10_6/I
Free-standing nanostructures at atomic scale: from growth mechanisms to local properties at the nanoscale
Jordi Arbiol[a,b]
[a] Institut Català de Nanociència i Nanotecnologia (ICN2), CSIC and The Barcelona Institute of Science and Technology (BIST), Campus UAB, Bellaterra, 08193 Barcelona, Catalonia, Spain
[b] ICREA, Pg. Lluís Companys 23, 08010 Barcelona, Catalonia, Spain

11:25 I-10_7/O
Shape controlled TiO_2 nanocrystals: on the role of surface properties in tuning their photocatalytic applications
Massimiliano D'Arienzo[1], Matteo Redaelli[1], Barbara Di Credico[1], Roberto Scotti[1], Stefano Polizzi[2], Franca Morazzoni[1]
[1]University of Milano-Bicocca, Dept. of Materials Science, Via R. Cozzi 55, 20125, Milano. [2]Dipartimento di Scienze Molecolari e Nanosistemi, Universita Ca' Foscari Venezia Via Torino 155/b, 30172 Venezia-Mestre.

11:45 I-10_8/O
Tailoring the Surface Properties of TiO_2: Shape Controlled Nanoparticels for the Optimization of Functional Properties
Francesco Pellegrino,[a] Letizia Pellutiè,[a] Gianmario Martra,[a] Vasile-Dan Hodoroaba,[b] Raluca Isopescu,[c] and Valter Maurino,[a]
[a] Department of Chemistry, Università degli Studi di Torino, Via Verdi, 8 – 1012 Turin, Italy. [b] BAM Federal Institute for Materials Research and Testing, Unter den Eichen 87, 12205 Berlin, Germany. [c] R&D Consultanta si Servicii, 21 Tudor Arghezi Street, 020943 Bucharest, Romania.

12:05 I-10_9/O
Deposition of high surface area CuO photocatalyst on Al_2O_3 support
Lev Matoh
Faculty of chemistry and Chemical Technology, Večna pot 113, SI-1000 Ljubljana, Slovenia.

12:25 LUNCH

I-10/3

Chairman: Renata Solarska

14:20 I-10_10/I
3D Open-worked Inverse Opal Metal Oxide Architectures for Long Life, High Capacity Li-ion Battery Anodes and Cathodes
David McNulty[a], Sally O'Hanlon[a], Hugh Geaney[a], Alex Lonergan[a], and Colm O'Dwyer[a,b]
[a] Department of Chemistry, University College Cork, Cork T12 YN60, Ireland. [b] Micro-Nano Systems Centre, Tyndall National Institute, Lee Maltings, Cork T12 R5CP, Ireland.

14:45 I-10_11/O
Iron doping in $NdBa_{1-x}Co_2O_{5+\delta}$ layered perovskite cathodes: a structural and electrochemical investigation
Renato Pelosato[a], Alessandro Donazzi[b], Giulio Cordaro[a], Isabella Natali-Sora[c], Cinzia Cristiani[a], Giovanni Dotelli[a]
[a] Politecnico di Milano, Dipartimento di Chimica Materiali e Ingegneria Chimica, P.zza Leonardo da Vinci 32, 20133 Milano, Italy. [b] Politecnico di Milano, Dipartimento di Energia, Via Lambruschini 4, 20156 Milano, Italy. [c] Università di Bergamo, Dipartimento di Ingegneria e Scienze Applicate, Viale Marconi 5, 24044 Dalmine, Italy.

15:05 I-10_12/O
An investigation into the stability and oxygen cycling of non-stoichiometric $YBaCo_4O_{7+\delta}$
S.R.W.Johnston , B.Ray , I.S.Metcalfe
Newcastle University, School of Chemical Engineering and Advanced Materials, Newcastle University, Newcastle upon Tyne NE1 7RU, United Kingdom.

15:25 BREAK

I-10/4

Chairman: Jordi Arbiol

16:15 I-10_13/O
Magnetite Nanoparticles decorated with Human Ferritin: a smart platform for Magnetic Fluid Hyperthermia Cancer Treatment
A. Guerrini[a], B. Tenci[b], C. Innocenti[a], M. Mannini[a], L. di Cesare Mannelli[b], T. Mello[b], P. Ceci[c], E. Falvo[c], M. Basini[d], A. Lascialfari[d], C. Sangregorio[e].
[a] INSTM and LaMM, Dip. di Chimica "U. Schiff", Univ. di Firenze, 50019, Florence, Italy. [b] Dip. NEUROFARBA - Sez. Farmacologia, Univ. di Firenze, 50100, Florence, Italy. [c] CNR-IBPM, Dip. di Scienze Biochimiche, Univ. di Roma "Sapienza", 00185, Rome, Italy. [d] Dip. di Fisica and INSTM, Università degli Studi di Milano, 20133 Milan, Italy. [e] CNR-ICCOM and INSTM, Sesto F.no, 50019, Florence, Italy.

16:35 I-10_14/O
Effects of organic coating on hyperthermia efficiencies
M. Cobianchi[1], A. Lascialfari[2,1], V. Kusigerski[3], A. Mrakovic[3], N. Knezevic[4], D. Peddis[3,5] and E. Illes[3,6]
[1] Dipartimento di Fisica, Università degli Studi di Pavia and INSTM, I-27100, Italy. [2] Dipartimento di Fisica, Università degli Studi di Milano and INSTM, I-20133, Italy. [3] The Vinca Institute University of Belgrade, Serbia. [4]Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11000, Serbia. [5] Istituto di Struttura della Materia, CNR, Area Roma1, 00015, Italy. [6] Department of Physical Chemistry and Materials Science, University of Szeged, Aradi vt 1, 6720 , Hungary.

16:55 I-10_15/O
The interplay between pore size and wettability in solid-templated silica films
Luca Rimoldi[a,b], Valentina Pifferi[a,b], Francesco Segrado[a], Guido Soliveri[c], Luigi Falciola[a,b], Silvia Ardizzone[a,b], Daniela Meroni[a,b]
[a] Università degli Studi di Milano, Department of Chemistry, Via Golgi 19 20133, Milano, Italy. [b] Consorzio Interuniversitario Nazionale per la Scienza e la Tecnologia dei Materiali (INSTM), Via Giusti 9 50121 Firenze, Italy. [c] Polytechnique Montréal, Department of Engineering Physics, H3T 1J4 Montréal, Canada.

17:15 I-10_16/O
Amide Bond Formation Catalyzed by Amorphous Silica: the Key is the Distance Between Surface Silanols (SiOH) pairs
Albert Rimola,† Marco Fabbiani,‡ Mariona Sodupe,† Piero Ugliengo,§ Gianmario Martra §
†Departament de Química, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain. ‡Department of Science and High Technology, Università dell'Insubria, Via Valleggio 11, 22100 Como, Italy. §Dipartimento di Chimica and Nanostructured Interfaces and Surfaces (NIS) Inter-departmental centre, Università degli Studi di Torino, Via P. Giuria 7, 10125 Torino, Italy.

17:35 I-10_17/O
Biomineralization of Doped Cerias
Christopher Curran, Bryan W. Berger, Steven McIntosh
Department of Chemical and Biomolecular Engineering, Lehigh University, 111 Research Drive, Bethlehem PA 18015, USA.

I-12 – DEFECT CHEMISTRY, TRANSPORT AND REACTIVITY AT GAS/ELECTRODE INTERFACES

B. Fiore di Botta

Room B10

I-12/1

Chairman: Bilge Yildiz

9:00 I-12_1/I
Nanoscale Structure and Dynamics of Rare-Earth Oxide Films and Nanostructures Under Reaction Conditions
Jan Ingo Flege [a, b]
[a] University of Bremen, Institute of Solid State Physics, Otto-Hahn-Allee 1, 28359 Bremen, Germany. [b] University of Bremen, MAPEX Center for Materials and Processes, 28359 Bremen, Germany.

9:25 I-12_2/O
Control of metal-oxide interfaces for ceria-based nanocatalysts
Siwon Lee, Jongsu Seo, and WooChul Jung
Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), 291, Daehak-ro, Yuseong-gu, 34141 Daejeon, Republic of Korea.

9:45 I-12_3/O
On the reduction behavior of CeO_2 (100) and (111) surfaces
J. Hackl [a], T. Duchoň [b], D. N. Mueller [a], C. Mouls [c], M.I. Khan [a], S. Cramm [a], S. Nemšák [a], C.M. Schneider [a]
[a] Peter Grünberg Institut PGI-6, Forschungszentrum Jülich, Jülich, Germany. [b] Department of Surface and Plasma Science, Charles University in Prague, Prague, Czech Republic. [c] Universidade Estadual de Campinas, Campinas, Brazil.

10:05 I-12_4/O
The Influence of Surface Atomic Structure on Solid State Electrochemistry: Oxygen Exchange on $SrTiO_3$(110) Surfaces
Michele Riva [a], Markus Kubicek [b], Xianfeng Hao [c, d], Stefan Gerhold [a], Giada Franceschi [a], Michael Schmid [a], Herbert Hutter [b], Juergen Fleig [b], Cesare Franchini [c], Bilge Yildiz [e], Ulrike Diebold [a]
[a] Inst. Appl. Phys., TU Wien, Wiedner Hauptstraβe 8-10, 1040 Wien, Austria. [b] Inst. Chem. Technol. Analyt., TU Wien, Getreidemarkt 9, 1060 Wien, Austria. [c] Univ. Vienna, Fac. Phys. Center Comp. Mater. Sci., Sensengasse 8, 1090 Vienna, Austria. [d] Key Lab. Appl. Chem., Dep. Chem. Eng., Yanshan University, Qinhuangdao 066004, P.R. China. [e] Lab. Electrochem. Interfaces, Dep. Nucl. Sci. Eng., MIT, 77 Massachusetts Avenue, Cambridge, MA 02139, U.S.A.

10:25 I-12_5/O
Revealing inherent reactivity of metal nanoparticles supported on a mixed conducting oxide electrode for high-temperature electrocatalysis
Yoonseok Choi , Seung Keun Cha, Siwon Lee, Sang Ouk Kim, and WooChul Jung
Korea Advanced Institute of Science and Engineering, Department of Materials Science and Engineering, 291 Daehak-ro, Yuseong-gu, Daejeon, Republic of Korea.

10:45 BREAK

I-12/2

Chairman: Jan Ingo Flege

11:00 I-12_6/I
Oxygen Nonstoichiometry and Electrical Conductivity of Mn and Fe doped CeO_2
Tatsumi Ishihara [a, b], Kohei Hosoi [a], and Hackho Kim [a]
[a] Department of Applied Chemistry, Faculty of Engineering, Kyushu University, Motooka 744, Nishi-ku, Fukuoka, 819-0395, Japan. [b] International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University, Motooka 744, Nishi-ku, Fukuoka, 819-0395, Japan.

11:25 I-12_7/O
The Influence of Cobalt-doping on the Functional Properties of $SrTiO_3$
Y. Liu [a], D. N. Müller [b], S. Cramm [b], S. Baumann [a], C.M. Schneider [b], O. Guillon [a]
[a] Institute of Energy and Climate Research IEK-1 Materials Synthesis and Processing, Forschungszentrum Jülich GmbH, 52425 Jülich, Germany. [b] Peter Grünberg Institut PGI-6 Electronic properties, Forschungszentrum Jülich, 52425 Jülich, Germany.

11:45 I-12_8/O
Permeability and Ionic Conductivity of $CaTi_{0.9}Fe_{0.1}O_{3-\delta}$
Corinne Salles [a], Marlu César Steil [b, c] Jacques Fouletier [b, c], Jean Marc Bassat [d], Daniel Marinha [a]
[a] LSFC- SAINT-GOBAIN CREE, 550 Rue Alphonse Jauffret, 84300 Cavaillon, France. [b] Univ. Grenoble Alpes, LEPMI, F-38000 Grenoble, France. [c] CNRS, LEPMI, F-38000 Grenoble, France. [d] Univ. Bordeaux, CNRS, ICMCB, F-33608 Pessac, France.

12:05 I-12_9/O
Oxygen permeation properties of $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$ at low temperatures below 500°C
Yoshiaki Hayamizu, Itaru Oikawa, Hitoshi Takamura
Tohoku University, Department of Materials Science, 980-8579, Japan.

12:25 LUNCH

I-12/3

Chairman: Tatsumi Ishihara

14:20 I-12_10/O
Oxygen mobility and surface reactivity of Ca-doped Pr_2NiO_4
Vladislav Sadykov [a, b], Elena Pikalova [c, d], Alexander Kolchugin [c, d], Nikita Eremeev [a], Nina Bogdanovich [c], Pavel Skriabin [a], Alexey Krasnov [a], Ekaterina Sadovskaya [a, b], Alexander Shmakov [a, b, e], Zakhar Vinokurov [a, e], Arcady Ishchenko [a, b], Sergey Pikalov [d, f], Elena Filonova [d]
[a] Boreskov Institute of Catalysis SB RAS, pr. Akad. Lavrentieva 5, Novosibirsk 630090, Russia. [b] Novosibirsk State University, Pirogova str. 2, Novosibirsk 630090, Russia. [c] Institute of High Temperature Electrochemistry UB RAS, Akademicheskaya str. 20, Yekaterinburg 620137, Russia. [d] Ural Federal University, Mira str. 19, Yekaterinburg 620002, Russia. [e] Budker Institute of Nuclear Physics SB RAS, pr. Akad. Lavrentieva 11, Novosibirsk 630090, Russia. [f] Institute of Metallurgy, UB RAS, Amundsena str. 101, Yekaterinburg 620137, Russia.

14:40 I-12_11/O
Oxygen permeation properties of mixed conductive (Sm, Ca)FeO_3
Isao Kagomiya, Yuki Hirota, Kyosuke Tsunekawa, Ken-ichi Kakimoto
Nagoya Institute of Technology, Life Science and Applied Chemistry, 466-8555, Japan.

15:00 I-12_12/O
Oxygen Mobility in $BaGd_{1-x}Yb_xMn_2O_{5+\delta}$ Oxygen Storage Materials
Kun Zheng, Jacek Jagusztyn, Konrad Świerczek
AGH University of Science and Technology, Faculty of Energy and Fuels, al. A. Mickiewicza 30, 30-059 Krakow, Poland.

15:20 I-12_13/O
Processing and Oxygen Permeation Studies of K_2NiF_4-Type $Ln_{1-x}Sr_{1+x}NiO_{4-\delta}$ with Highly Anisotropic Thermal Expansion
Aleksey Yaremchenko [a], Ekaterina Kravchenko [a, b], Kiryl Zakharchuk [a], Oleg Ignatenko [c], Jekabs Grins [d], Gunnar Svensson [d], Vladimir Pankov [b]
[a] CICECO – Aveiro Institute of Materials, Department of Materials and Ceramic Engineering, University of Aveiro, 3810-193 Aveiro, Portugal. [b] Department of Chemistry, Belarusian State University, Leningradskaya 14, Minsk, Belarus. [c] Scientific-Practical Materials Research Centre, NAS Belarus, Brovki 19, 220072 Minsk, Belarus. [d] Department of Materials and Environmental Chemistry, Stockholm University, Sweden.

15:40 BREAK

I-12/4

Chairman: Michele Riva

16:15 I-12_14/O
Oxygen separation with low silver content scandia-stabilised zirconia composite membranes
E Ruiz-Trejo, A. Bertei, A. Maserati, P. Boldrin and N. P. Brandon
Department of Earth Science and Engineering, Imperial College London, SW7 2AZ, UK.

16:35 I-12_15/O
Guidelines for selecting coating materials for a high oxygen permeation flux in GDC-rich composite membrane
Young-il Kwon [a], Beom Tak Na [a], Jeong Hwan Park [a], Kyong Sik Yun [b], Ji Haeng Yu [b], Jong Hoon Joo [a]
[a] Department of Advanced Material Engineering, Chungbuk National University, 1Chungdae-ro, Seowon-gu, Cheongju, Chungbuk 28644, (Republic of Korea). [b] Advanced Materials & Devices Laboratory, Korea Institute of Energy Research, 152 Gajeong-ro, Daejeon 34129, (Republic of Korea).

16:55 I-12_16/O
Elucidation of the surface exchange kinetics in dual-phase membrane by the permeation model
Beom Tak Na [a], Jong Hyuk Park [a], Ji Haeng Yu [b], Jong Hoon Joo [a]
[a] Chungbuk National University, Department of Advanced Material Engineering, Chungdae-ro 1, Cheongju 28644, Republic of Korea. [b] Korea Institute of Energy Research, Separation and Conversion Materials Laboratory, 152 Gajeong-ro, Daejeon 34129, Republic of Korea.

17:15 I-12_17/O
Direct AC heating of mixed conducting membranes to promote oxygen permeation
Mikhail P. Popov, Sergey F. Bychkov, Natalya V. Bulina, Alexander P. Nemudry
Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia.

17:35 I-12_18/O
Modeling of conductivity relaxation experiments on oxide ceramics taking account of concentration dependent chemical diffusivities and surface exchange coefficients
Wolfgang Preis
Chair of Physical Chemistry, Montanuniversitaet Leoben, Franz-Josef-Strasse 18, A-8700 Leoben, Austria.

I-14 – ELECTROCATALYSIS AT THE ELECTRODE-SOLID ELECTROLYTE INTERFACE

B. Fiore di Botta

Room B4

I-14/1

Chairman: Piotr Zelenay

9:00 I-14_1/K
An Overview of the U.S. Department of Energy's Hydrogen and Fuel Cells Program
Adria Wilson, Dimitrios Papageorgopoulos, Sunita Satyapal
Department of Energy, Fuel Cell Technologies Office, 1000 Independence Ave SW, Washington, D.C. 20585.

9:30 I-14_2/O
ElectroCat: DOE's Approach to PGM-Free Catalyst and Electrode R&D
Adria Wilson
Department of Energy, Fuel Cell Technologies Office, 1000 Independence Ave SW, Washington, D.C. 20585.

9:50 I-14_3/O
Electrocatalytic materials based on non-carbon supports for electrochemical devices
A. V. Levchenko, E. V. Gerasimova, A. A. Belmesov, A. V. Tchub, Y. A. Dobrovolsky
Institute for Problems of Chemical Physics RAS, Chernogolovka 142432.

10:10 I-14_4/O
Electrochemical Promotion of CO Oxidation by on a Dual Ion Conducting Ceramic Support
Efstratios Stavrakakis, Danai Poulidi
School of Chemistry and Chemical Engineering, Queen's University.

10:30 BREAK

I-14/2

Chairman: Sanjeev Mukerjee

11:00 I-14_5/I
pH effects in electrocatalysis
Marc T.M. Koper
Leiden Institute of Chemistry, Leiden University, 2300 RA Leiden, The Netherlands.

11:25 I-14_7/O
Kinetic Study on Cathode Double Perovskite $LnBa_xSr_{1-x}Co_yFe_{1-y}O_{5+\delta}$ (Ln=Gd,Pr) Materials of Solid Oxide Fuel Cell: Insight from Experiments and Theory
Uzma Anjum[a], Manish Agarwal[b], Tuhin Suvra Khan[a], M. Ali Haider[a]
[a] IIT Delhi, Chemical Engineering, Huaz Khas, New Delhi-110016, India. [b] IIT Delhi, Computer Service Center, Huaz Khas, New Delhi-110016, India.

11:45 BREAK and LUNCH

I-14/3

Chairman: Deborah Myers

14:20 I-14_8/I
Critical Interfaces in PEM Fuel Cells: Understanding Behavior through Advanced Microscopy Studies
Karren L. More,[a] Brian T. Sneed,[a] and David A. Cullen[b]
[a] Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, TN USA. [b] Materials Science & Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN USA.

14:45 I-14_9/I
Comparison of the aging mechanisms of carbon-supported electrocatalysts in polymer versus liquid aqueous electrolytes: an identical-location transmission electron microscopy (IL-TEM) study
Clémence Lafforgue[a], Anicet Zadick[a], Flávio R. Nikkuni[a,b], Laetitia Dubau[a], Frédéric Maillard[a], Marian Chatenet[a,c]
[a] Univ. Grenoble Alpes, CNRS, LEPMI, F-38000 Grenoble, France. [b] Instituto de Química de São Carlos, U. de São Paulo, 13560-970 São Carlos, SP, Brazil. [c] French University Institute (IUF), Paris, France.

15:10 I-14_10/O
Electrochemical performance of a Co_3O_4-CeO_2/BZCY72/BGLC proton conducting solid oxide cell fed with H_2S/H_2O mixtures
Tzouliana Kraia[a,b], Vasileios Kyriakou[b,c], Michalis Konsolakis[d], Ragnar Strandbakke[e], George Marnellos[a,b]
[a] University of Western Macedonia, Department of Mechanical Engineering, Bakola & Sialvera, 50100, Kozani, Greece. [b] Centre for Research and Technology Hellas, Chemical Process & Energy Resources Institute, 6th km Charilaou-Thermi Rd., 57001, Thessaloniki, Greece. [c] Aristotle University of Thessaloniki, Department of Chemical Engineering, Building E13, Thessaloniki, Greece. [d] Technical University of Crete, School of Production Engineering and Management, University Campus, 73100 Chania, Greece. [e] University of Oslo, Department of Chemistry, FERMiO, Gaustadalleen 21, 0349, Oslo, Norway.

15:30 I-14_11/O
Water splitting in absence of liquid water: a microelectrode study
Jan Rongé, Gino Heremans, Johan A. Martens
KU Leuven, Centre for Surface Chemistry and Catalysis, Celestijnenlaan 200F, 3001 Leuven, Belgium.

15:50 BREAK

I-14/4

Chairman: Makoto Uchida

16:15 I-14_12/I
Analysis of catalysts, ionomers and their interfaces with modern analysis tools
Hideto Imai
NISSAN ARC Ltd., Device-functional Analysis Department, 1 Natsushima Yokosuka, 237-0061, Japan.

16:40 I-14_13/I
Impact of Cation-Hydroxide-Water Co-adsorption on Alkaline Hydrogen Oxidation Reaction
Yu Seung Kim[a], Hoon Taek Chung[a], Ulises Martinez[a], Joseph Dumont[a,b], Plamen Atanassov[a,b], Ivana Matanovic[b,c]
[a] MPA-11: Materials Synthesis and Integrated Devices, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, United States. [b] Department of Chemical and Biological Engineering Center for Micro-Engineered materials (CMEM), The University of New Mexico, Albuquerque, New Mexico 87231, United States. [c] T-1: Physics and Chemistry of Materials, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, United States.

17:05 I-14_14/O
PGM-free Electrocatalysts for Hydrogen Oxidation Reaction in Alkaline Media
Alexey Serov,[a] Sadia Kabir,[a] Madeleine Odgaard,[b] Iryna V. Zenyuk,[c] Plamen Atanassov[a]
[a] Department of Chemical & Biological Engineering, Center for Micro-Engineered Materials, University of New Mexico, Albuquerque, NM 87131, USA. [b] EWII Fuel Cells, LLC., 8500 Washington St. NE, B-1, Albuquerque, NM, 87113, USA. [c] Department of Mechanical Engineering, Tufts University, 200 College Avenue, Medford, MA 02155, USA.

17:25 I-14_15/O
On the formation of 2D Pt on highly oriented pyrolytic carbon (HOPG)
Mario A. Alpuche-Aviles,[a] Filippo Farina,[b] Giorgio Ercolano,[b] Sara Cavaliere,[b] Deborah Jones,[b] and Jaques Rozière,[b]
[a] Department of Chemistry, University of Nevada, Reno, Nevada, 89557, United States of America. [b] Institut Charles Gerhardt, UMR CNRS 5253, Agrégats Interfaces et Matériaux pour l'Energie, Université de Montpellier, 34095 Montpellier Cedex 5, France.

MACRO-AREA III: IONICS IN COMMUNICATION AND ROBOTICS

III-1 – IONICS MEETS BIOSCIENCE

B. Fiore di Botta

Room B8

III-1/1

Chairman: Kyoko Fujita

14:20 III-1_1/I
What can ionic liquids do for bioscience?
Hiroyuki Ohno
Department of Biotechnology, Tokyo University of Agriculture and Technology, 2-24-16 Koganei, Tokyo 184-8588, Japan.

14:45 III-1_2/I
Exploring ionic liquids as unexpected means for fungal biology and biotechnology
Cristina Silva Pereira
Instituto de Tecnologia Química e Biológica António Xavier, Universidade Nova de Lisboa (ITQB NOVA), Av. da República, 2780-157 Oeiras, Portugal

15:10 III-1_3/O
Fractionation of woody biomass into polysaccharides and lignin under mild condition
Takashi Akiba [a, b], Akiko Tsurumaki [a, b], and Hiroyuki Ohno [a, b]
[a] Department of Biotechnology and Life-science–Tokyo University of Agriculture and Technology. [b] Functional Ionic Liquid Laboratories–Tokyo University of Agriculture and Technology, 2-24-16, Nakacho, Koganei, Tokyo 184-8588, Japan.

15:30 III-1_4/O
Reaction Mechanism of Transesterification of Cellulose in Ionic liquids
Kenji Takahashi[a], Ryohei Kakuchi[a], Kazuaki Ninomiya[a], Tomoyuki Ikai[a], Katsuhiro Maeda[a], Hadi Abroshan[b], Hyung Kim[b]
[a] Kanazawa University, Kanazawa, 920-1192, Japan. [b] Carnegie Mellon University, Pittsburgh, Pennsylvania 15213, USA.

15:50 BREAK

III-1/2

Chairman: Kenji Takahashi

16:15 III-1_5/I
Electron Transfer Reaction of Proteins in Hydrated Ionic Liquids
Kyoko Fujita
Tokyo University of Pharmacy and Life Sciences, School of Pharmacy, 192-0392, Japan.

16:40 III-1_6/I
Solubilizing and Stabilizing Enzymes in Ionic Liquids for Anhydrous Biocatalysis
Jason P. Hallett, Alex P. S. Brogan
Imperial College London, London, UK.

17:05 III-1_7/I
Ionic liquids for biomaterials synthesis and solar thermal storage
Masa-aki Morikawa
Department of Chemistry and Biochemistry, Graduate School of Engineering, Kyushu University, 744 Moto-oka Nishi-ku, Fukuoka 819-0395, Japan.

17:30 III-1_8/O
Highly Stretchable, Transparent Ionic Touch Panel.
Chong-Chan Kim[a], Hyun-Hee Lee[a], Kyu Hwan Oh[a, b], Jeong-Yun Sun[a, b]
[a] Departmant of Material Science and Engineering, Seoul National University, Seoul 151-742, South Korea. [b] Research Institute of Advanced Materials (RIAM), Seoul National University, Seoul 151-744, South Korea.

17:50 III-1_9/O
Theoretical Validation for Mechanisms of Microbial Extracellular Electron Transfer (EET) using Electrochemical and Microscopic Characterisation: An Improved MFC Performance under Optimal Cultivation and Immobilisation Conditions
Pruetsaji Winaikij[a], Paiboon Sreearunothai[b], Korakot Sombatmankhong[c]
[a] Interdisciplinary Graduate Program in Advanced and Sustainable Environmental Engineering (International Program), Faculty of Engineering, Sirindhorn International Institute of Technology, Pathum Thani 12120, Thailand. [b] Department of Common and Graduate Studies, Sirindhorn International Institute of Technology, Pathum Thani 12120, Thailand. [c] National Metal and Materials Technology Center, 114 Thailand Science Park, Phahonyothin Road, Khlong Nueng, Khlong Luang, Pathum Thani 12120, Thailand.

MACRO-AREA IV: GENERAL ASPECTS, FUNDAMENTALS AND THEORY IN ION-CONDUCTING MATERIALS

IV-1 – MODELLING AND SIMULATION OF ION-CONDUCTING MATERIALS

B. Fiore di Botta

Room B5

IV-1/1

Chairman: Stephen Paddison

9:00 IV-1_1/K
Simulations of Idealized Solid Electrolytes
N. A. W. Holzwarth
Wake Forest University, Department of Physics, Winston-Salem, NC, USA.

9:30 IV-1_2/I
Water sub-diffusion in membranes for fuel cells
Stefano Mossa
INAC, CEA, CNRS, Université Grenoble Alpes, CEA Grenoble 38000, France.

9:55 IV-1_3/O
Conductivity of Solid Polyelectrolyte Complexes with Varying Water Content: Application of the Dynamic Structure Model
Cornelia Cramer, Annika Ostendorf, Monika Schönhoff
Inst. f. Phys. Chem., University of Muenster, Corrensstraße 28/30, 48149 Münster, Germany.

10:15 IV-1_4/O
Modelling of solid-state electrolytes for Li-ion batteries.
Pooja M. Panchmatia[a], Matthew A. Howard[b], Paul A. Anderson[b], Peter R. Slater[b]
[a] Department of Chemistry, Loughborough University, Loughborough LE11 3TU, UK. [b] School of Chemsitry, University of Birmingham, Birmingham B15 2TT, UK.

10:35 BREAK

IV-1/2

Chairman: Yue Qi

11:00 IV-1_5/O
Computational Study of Oxygen Diffusion along *a*[100] Dislocations in the Perovskite Oxide $SrTiO_3$
Stephan P. Waldow, Roger A.de Souza
Institute of Physical Chemistry, RWTH Aachen University, Landoltweg 2, 52062 Aachen, Germany.

11:20 IV-1_6/O
Interstitial versus Interstitialcy Diffusion of Oxygen in $La_2NiO_{4+\delta}$
Taner Akbay[a], Aleksandar Staykov[b], Ji Wu[b], Tatsumi Ishihara[a, b, c], John A. Kilner[b, d]
[a] Kyushu University, Advanced Research Centre for Electric Energy Storage, 744 Motooka, Nishi-ku, Fukuoka 802-0395, Japan. [b] Kyushu University, International Institute for Carbon Neutral Energy Research, 744 Motooka, Nishi-ku, Fukuoka 802-0395, Japan. [c] Kyushu University, Department of Applied Chemistry, 744 Motooka, Nishi-ku, Fukuoka 802-0395, Japan. [d] Imperial College London, Department of Materials, South Kensington, London SW7 2BP, United Kingdom.

11:40 IV-1_7/O
Deviation from Nernst-Einstein Relation: Correlation Function Approach
Junichi Kawamura[a], Naoaki Kuwata[a], Reiji Takekawa[a], Michio Tokuyama[a], and Osamu Kamishima[b]
[a] Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 2-1-1 Katahira, Sendai, 980-8577 Japan. [b] FacultyofScienceandEngineering, SetsunanUniversity, Osaka572-8508, Japan.

12:00 IV-1_8/O
Non-equilibrium molecular dynamics for studying ionic diffusion in oxides: application to doped ceria
Johan Nilsson[a], Olga Yu. Vekilova[b], Mikael Leetmaa[a], Sergei I. Simak[c], Natalia V. Skorodumova[a, b]
[a] Department of Materials Science and Engineering, KTH - Royal Institute of Technology, Brinellvägen 23, 100 44 Stockholm, Sweden. [b] Department of Physics and Astronomy, Uppsala University, Box 516, 751 20 Uppsala, Sweden. [c] Department of Physics, Chemistry and Biology (IFM), Linköping University, 581 83, Linköping, Sweden.

12:20 LUNCH

IV-1/3

Chairman: Stefano Mossa

14:20 IV-1_9/K
Modeling Charge Attachment Induced Ion Transport – Electro-diffusion, chemical diffusion and grain boundary diffusion
Karl-Michael Weitzel
Philipps Universität Marburg – Chemistry Department, Marburg, Germany.

14:50 IV-1_10/K
Promoting oxide and proton conductivity in electrode materials for solid oxide electrochemical cells: first-principles design strategies
Michele Pavone, Ana B. Muñoz-García
University of Naples FedericoII, Department of Chemical Sciences, Comp. Univ. Monte Sant'Angelo Via Cintia 26, Napoli 80126, Italy.

15:20 IV-1_11/O
Determination of Diffusion Coefficients *D* and *K* by Relaxation Methods for the Sphere-shaped Powder Samples
Kun Zheng, Konrad Świerczek
AGH University of Science and Technology, Faculty of Energy and Fuels, al. A. Mickiewicza 30, 30-059 Krakow, Poland.

15:40 IV-1_12/O
Defect interactions and migration in Zr-doped ceria
Steffen Grieshammer[a, b, c]
[a] Helmholtz-Institut Münster, Forschungszentrum Jülich GmbH, Germany. [b] Institute of Physical Chemistry, RWTH Aachen University, Germany. [c] JARA-HPC, RWTH Aachen University & Forschungszentrum Jülich, Germany.

16:00 BREAK

IV-1/4

Chairman: Michele Pavone

16:20 IV-1_13/O
Defect Interaction and Ordering in Gd-doped Ceria: A Combined DFT, Cluster Expansion and Monte Carlo Study
Pjotrs A. Žguns[a, b], Andrei V. Ruban[b, c], Natalia V. Skorodumova[a, b]
[a] Uppsala University, Department of Physics and Astronomy, Box 516, 751 20 Uppsala, Sweden. [b] KTH Royal Institute of Technology, Department of Materials Science and Engineering, 100 44 Stockholm, Sweden. [c] Materials Center Leoben Forschung GmbH, A-8700 Leoben, Austria.

16:40 IV-1_14/O
Efficient Analysis of the Potential Energy Surface of a Mobile Ion in a Crystal: A Machine-Learning-Based Selective Sampling
Kazuaki Toyoura[a], Kenta Kanamori[b], Daisuke Hirano[b], Makoto Otsubo[a], Masayuki Karasuyama[b], Tetsuya Uda[a], Ichiro Takeuchi[b]
[a] Department of Materials Science & Engineering, Kyoto University, Kyoto 606-8501, Japan. [b] Department of Engineering, Nagoya Institute of Technology, Nagoya 466-8555, Japan.

17:00 IV-1_15/O
Bayesian and Hierarchical Bayesian Based Regularization for Deconvolving the Distribution of Relaxation Times from Electrochemical Impedance Spectroscopy Data
Mohammed B. Effat [a], Francesco Ciucci [a, b]
[a] The Hong Kong University of Science and Technology, Department of Mechanical and Aerospace Engineering, Hong Kong, China. [b] The Hong Kong University of Science and Technology, Department of Chemical and Biomolecular Engineering, Hong Kong, China.

17:20 IV-1_16/O
First-principles study of the properties bismuth titanate pyrochlores doped by Mg, Ca, Sr, Ba
Aleksei Krasnov[a], Igor Shein[b], Irina Piir[a]
[a] Institute of Chemistry, Komi Science Center UB RAS, Pervomaiskaya st. 48, Syktyvkar, 167982, Russia. [b] Institute of Solid State Chemistry, UB RAS, Pervomaiskaya st. 91, Ekaterinburg, 620990, Russia.

17:40 IV-1_17/O
Atomistic Simulations of Ion transport in Neuromorphic Systems Using First Principles Based Machine Learnt Models
Kiran Sasikumar[a], Badri Narayanan[a], Mathew Cherukara[b], Henry Chan[a], Subramanian K.R.S. Sankaranarayanan[a]
[a] Center for Nanoscale Materials, Argonne National Laboratory, Argonne IL 60439. [b] Advanced Photon Source, Argonne National Laboratory, Argonne IL 60439.

IV-2 – ADVANCES IN HIGH SPATIAL RESOLUTION PROBING OF LOCAL HETEROGENEITIES IN ION-CONDUCTING MATERIALS

A. Padova Fiere

Room A4

IV-2/1

Chairmen: Peter Crozier, David McComb

9:00 IV-2_1/I
Ion beam imaging with SIMS and LEIS
John Kilner[a, b], John Druce[a] and Helena Téllez Lozano[a]
[a] Electrochemical Energy Conversion Division, WPI-International Institute for Carbon-Neutral Energy Research (I²CNER), Fukuoka, Japan. [b] Department of Materials, Imperial College London, London, UK.

9:25 IV-2_2/I
Atomic Resolution STEM Characterization of the Interfaces and Surfaces in Li-ion Battery Crystals
Yuichi Ikuhara[a, b, c]
[a] Institute of Engineering Innovation, The University of Tokyo, Tokyo, 113-8656, Japan. [b] Nanostructures Res. Lab., Japan Fine Ceramics Center, Nagoya, 456-8587, Japan. [c] WPI-AIMR Research Center, Tohoku University, Sendai, 980-8577, Japan.

9:50 IV-2_3/O
Charge Attachment Induced Transport – Bulk and Grain Boundary Diffusion of Potassium in $PrMnO_3$
Johannes Martin [a], Melanie Gräf [a], Thilo Kramer [b], Christian Jooss [b], Min-Ju Choe [c], Katsuyo Thornton [c], Karl-Michael Weitzel [a]
[a] Philipps Universität Marburg – Chemistry Department, Marburg, Germany.
[b] Georg-August Universität Göttingen – Institute for Material Physics, Göttingen, Germany. [c] University of Michigan – Department of Materials Science & Engineering, Ann Arbor, MI, USA.

10:10 IV-2_4/O
Elucidating Enhanced Grain Boundary Electrical Conductivity via Local Mapping of Bandgap Electronic State in $Pr_xCe_{1-x}O_{2-\delta}$
William J. Bowman [a, b], Eva Sediva [b, c], Toshihiro Aoki [d], Jennifer L. M. Rupp[b,c], Peter A. Crozier [a]
[a] School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, AZ, US, 85287. [b] Electrochemical Materials Group, ETH Zürich, Switzerland, 8004. [c] Materials Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge, MA, 02139. [d] Leroy Eyring Center for Solid State Science, Arizona State University, Tempe, AZ, US, 85287.

10:30 BREAK

IV-2/2

Chairmen: Y. Shirley Meng, M. Stanley Whittingham

11:00 IV-2_5/I
Elucidating Interfacial Reactions in Rechargeable Alkali-Ion Batteries
Shyue Ping Ong
Department of NanoEngineering, University of California, San Diego, 9500 Gilman Drive, Mail Code 0448, La Jolla, CA 92093, USA.

11:25 IV-2_7/O
The Nanoscale Structure of the Electrolyte-metal Oxide Interface
Hans-Georg Steinrück[a], Chuntian Cao[a, b], Yuchi Tsao[a, b], Christopher J. Takacs[a], Jenel Vatamanu[c], Oleg Borodin[c], Michael F. Toney[a]
[a] SSRL Materials Science Division, SLAC National Accelerator Laboratory, Menlo Park, California 94025, United States. [b] Department of Materials Science and Engineering, Stanford University, Stanford, California 94305, United States. [c] Electrochemistry Branch, Sensor and Electron Devices Directorate, U. S. Army Research Laboratory, Adelphi, MD 20783, USA.

11:45 IV-2_8/O
Probing Local Ionic Transport in Lithium Battery Cathode Materials using Atomic Force Microscopy
Aaron Mascaro[a], Zi Wang[b], Pierre Hovington[c], Yoichi Miyahara[a], Andrea Paolella[c], Vincent Gariepy[c], Zimin Feng[c], Karim Zaghib[c], Kirk H. Bevan[b], Peter Grutter[a]
[a] McGill University, Department of Physics, 3600 rue University, Montreal, Canada. [b] McGill University, Materials Engineering, 3610 rue University, Montreal, Canada. [a] Institut de Recherche d'Hydro Quebec, 1800 blvd. Lionel-Boulet, Varennes, Canada.

12:05 IV-2_9/O
Theoretical analyses on the pseudocapacitive RuO_2/water interfaces
Eriko Watanabe[a], Hiroshi Ushiyama[a], Koichi Yamashita[a], Daisuke Asakura[b], Masashi Okubo[a], Atsuo Yamada[a]
[a] Department of Chemical System Engineering, School of Engineering, The University of Tokyo, Bunkyo-ku, Tokyo 113-8656, Japan. [b] Research Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology, Tsukuba, Ibaraki 305-8568, Japan.

12:25 LUNCH

IV-2/3
Chairmen: Peter Crozier, David McComb

14:20 IV-2_10/I
Probing Dynamic Nano-Scale Solid State Electrochemistry by *in situ* Analytical Electron Microscopy
Ziying Wang, Jungwoo Lee, and Y. Shirley Meng
Department of NanoEngineering, University of California San Diego, 9500 Gilman Drive, La Jolla, CA 92109, USA.

14:45 IV-2_11/I
Advances in X-ray Imaging for Energy Materials Applications
P. R. Shearing
Electrochemical Innovation Lab, Dept. Chemical Engineering, University College London.

15:10 IV-2_12/O
Structure determination at atomic resolution of layered-perovskites for air electrodes for IT-SOFCs by means of high advanced STEM techniques
Susana García-Martín[a], Daniel Muñoz-Gil[a], Xabier Martínez de Irujo-Labalde[a], David Ávila-Brande[a], Esteban Urones-Garrote[b]
[a] Complutense University, Department of Inorganic Chemistry, Dpto.de Química Inorgánica, Facultad de Ciencias Químicas, Universidad Complutense, 28040-Madrid, Spain. [b] Complutense University, Centro Nacional de Microscopía Electrónica, Universidad Complutense, 28040-Madrid, Spain.

15:30 IV-2_13/O
The role of adsorbed metal cations in the surface stability of perovskite oxide cathodes
Dongha Kim, Roland Bliem, Bilge Yildiz
Massachusetts Institute of Technology, Department of Materials Science and Engineering and Department of Nuclear Science and Engineering, 77 Massachusetts Av., 02139 Cambridge, USA.

15:50 BREAK

IV-2/4

Chairmen: Y. Shirley Meng, M. Stanley Whittingham

16:15 IV-2_15/I
Microstructural and Electrochemical Studies of Solid Oxide Fuel Cell Anodes Formed by *in situ* Catalyst Exsolution
Scott A Barnett[a], Tenglong Zhu[a], Horacio Troiani[b], Liliana V Mogni[b]
[a] Northwestern University, Department of Materials Science, Evanston, IL, USA. [b] Centro Atomico Bariloche, Departamento Caracterización de Materiales, Av. Bustillo 9500, CP 8400, S. C.de Bariloche, Argentina.

16:40 IV-2_16/I
Characterizing ordering phenomena at the atomic scale through high-resolution electron microscopy and simulation
David W. McComb
Center for Electron Microscopy and Analysis, The Ohio State University, Columbus, Ohio 43212, USA.

17:05 IV-2_17/O
Enhanced Ionic Conductivity in Electroceramics by Nanoscale Control of Grain Boundary Composition
William J. Bowman [a], Madeleine N. Kelly [b], Gregory S. Rohrer [b], Cruz A. Hernandez [a], Peter A. Crozier [a]
[a] School for Engineering of Matter, Transport and Energy, Arizona State University, 501 E. Tyler Mall, Tempe, AZ, US 85287. [b] Department of Materials Science and Engineering, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA, US 15213.

17:25 IV-2_18/O
A Theory of Co-Accumulation and Depletion at Grain Boundaries in Acceptor-Doped Ceria
David S. Mebane[a], Xiaorui Tong[a], Alex Zurhelle[b], Roger A.de Souza[b] Brian Gorman[c] and David Diercks[c]
[a] West Virginia University, Department of Mechanical and Aerospace Engineering, Morgantown, WV, USA. [b] RWTH Aachen University, Institute of Physical Chemistry, Aachen, Germany. [c] Colorado School of Mines, Metallurgical and Materials Engineering, Golden, CO, USA.

17:45 IV-2_14/O
Effect of electric field during sintering on the local chemistry of 8YSZ grain boundaries analyzed by Atom Probe Tomography
Carine Perrin-Pellegrino[b], Dominique Mangelinck[b], Daniel Marinha[a]
[a] LSFC, UMR 3080 Saint-Gobain CREE/CNRS, 550 Avenue Alphonse Jauffret, 84306 Cavaillon, France. [b] IM2NP, Faculté des Sciences et Techniques, Avenue Escadrille Normandie Niemen, Case 142, 13397 Marseille Cedex 20, France.

IV-5 – Transport in Morphologically Heterogeneous Porous Media: Advancing Characterization from In-Situ to In-Operando

A. Padova Fiere

Room A5

IV-5/1

Chairman: Iryna Zenyuk

9:00 IV-5_1/K
Revealing sub-second dynamics of liquid water transport in Polymer Electrolyte Fuel Cells by 4D X-ray Tomographic Microscopy
Jens Eller[a], Hong Xu[a], Federica Marone[b], Felix N. Büchi[a]
[a] Paul Scherrer Institut, Electrochemistry Laboratory, Villigen PSI, Switzerland. [b] Paul Scherrer Institut, Swiss Light Source, Villigen PSI, Switzerland.

9:30 IV-5_2/I
Exposing microscale transport behaviour in the porous materials of polymer electrolyte membrane fuel cells
Aimy Bazylak
Department of Mechanical & Industrial Engineering, Faculty of Applied Science & Engineering, Institute for Sustainable Energy, University of Toronto, Toronto, Ontario, Canada.

9:55 IV-5_3/I
Extracting quantitative data from 3D imaging of heterogeneous porous media: Statistics, transport and electrochemical reaction
Marc Secanell[a], Mayank Sabharwal[a], Lalit Pant[a], Andreas Putz[b], Jasna Jankovic[b] and Darija Susac[b]
[a] University of Alberta, Department of Mechanical Engineering, Edmonton, AB, T6G1H9, Canada. [b] AFCC Automotive Fuel Cell Cooperation, Burnaby, BC, V5J5J8, Canada.

10:20 IV-5_4/O
Characterization of Transport Processes in Porous Media with X-ray Computed Tomography
Iryna V. Zenyuk
Tufts University, Mechanical Engineering, 200 Boston Ave. 2600, Medford, MA, USA.

10:40 BREAK

IV-5/2

Chairman: Radenka Maric

11:00 IV-5_5/I
Membrane Degradation in PEM Fuel Cells: Antioxidant Migration and Recoverable Degradation Losses
R. L. Borup[a], A. M. Baker[a, b], R. Mukundan[a], D. Spernjak[a], E. J. Judge[a], S. G. Advani[b], and A. K. Prasad[b]
[a] Los Alamos National Laboratory, P. O. Box 1663, MS D429, Los Alamos, NM 87545, USA. [b] Department of Mechanical Engineering, University of Delaware, Newark, DE 19717, USA.

11:25 IV-5_6/O
Degradation analysis of polymer electrolyte membrane fuel cells with gradient cathode catalyst layers
Radenka Maric[a], Andrea Bisello[b], Andrea Baricci[b], Haoran Yu[a], Laure Guetaz[c], Andrea Casalegno[b]
[a] Department of Chemical and Biomolecular Engineering, University of Connecticut, 191 Auditorium Road, Unit 3222 Storrs, CT 06269-3222, USA. [b] Department of Energy, Politecnico di Milano, via Lambruschini 4 Milano, 20156, Italy. [c] Grenoble Electron Microscopy @ Minatec, CEA-Grenoble, 38054 Grenoble Cedex 9, France.

11:45 IV-5_7/O
A Novel Approach for Supercapacitors Degradation Characterization
Alon Oz [a], Danny Gelman[b], Sioma Baltianski[b], Yoed Tsur[a, b]
[a] The Nancy and Stephen Grand Technion Energy Program, Technion – Israel Institute of Technology, Haifa 3200003. [b] Department of Chemical Engineering, Technion - Israel Institute of Technology, Haifa, Israel 3200003.

12:05 IV-5_8/O
***Operando* μ-Raman study of the actual water content of perfluorosulfonic acid membranes in the fuel cell: effect of temperature and flow channel design**
Stefano Deabate[a], Huguet Patrice[a], Thi Bich Hue Tran[a], Arnaud Morin[b]
[a] IEM (Institut Européen des Membranes), UMR 5635 (CNRS-ENSCM-UM), Université Montpellier, Place E. Bataillon, F-34095, Montpellier, France. [b] CEA-Liten/Université Grenoble Alpes, Grenoble F-38000, France.

12:25 LUNCH

IV-5/3

Chairman: Adam Weber

14:20 IV-5_9/I
PEFC catalyst layer (CL) ionomer: The long-road to unraveling its role in CL transport processes
Kunal Karan
University of Calgary, Department of Chemical & Petroleum Engineering, 2500 University Dr NW, Calgary, Canada.

14:45 IV-5_10/I
Ionomer-Associated Transport Resistances in Fuel Cell Electrodes
Adam Z. Weber[a], Tobias Schuler[a], Franz Spingler[a], Anna Freiberg[a], Michael C. Tucker[a], Anamika Chowdhury[a][b], K. C. Neyerlin[c], Ahmet Kusoglu[a]
[a] Lawrence Berkeley National Laboratory, Energy Conversion Group, Berkeley CA USA. [b] University of California, Berkeley, Department of Chemical and Biomolecular Engineering, Berkeley CA USA. [c] National Renewable Energy Laboratory, Golden, CO, USA.

15:10 IV-5_11/O
The influence of ionomer distribution on catalyst layer structure and proton exchange membrane fuel cell performance
Radenka Maric[a], Andrea Baricci[b], Haoran Yu[a]
[a] University of Connecticut, Departmento of Chemical and Biomolecular Engineering, 191 Auditorium road, Unite 3222, Storrs, Ct 06269. (b) Politecnico di Milano, Departent of Energy, Campus Bovisa - Via Lambruschini, 4-20156-Milano.

15:30 IV-5_12/O
In-situ Electrode Kinetics Study by Means of Oxygen Isotope Exchange and Electrochemical Impedance Spectroscopy
Maxim Ananyev[a, b], Anna Khodimchuk[a, b], Vadim Eremin[a, b], Evgeniy Tropin[a, b], Andrei Farlenkov[a, b], Edkhem Kurumchin[a], Dimitrii Bronin[a, b]
[a] Institute of High Temperature Electrochemistry of Ural Branch of Russian Academy of Sciences, Yekaterinburg, Akademicheskaya 20, 620137, Russian Federation. [b] Ural Federal University, Yekaterinburg, Mira 19, 620002, Russian Federation.

15:50 BREAK

IV-5/4

Chairman: Svitlana Pylypenko

16:15 IV-5_13/O
Sensors Made from Optically Fabricated 3D Nanostructures
Seokwoo Jeon
Department of Materials Science and Engineering, KAIST, Graphene Research Center, KINC, KAIST, 291 Daehak-ro, Yuseong Gu, Daejeon 305-701, Korea.

16:35 IV-5_14/O
Proton conduction via the water network in hydrophilic nanochannels
Hiroshi Matsui[a] and Makoto Tadokoro[b]
[a] Tohoku Univ., Department of Physics, Sendai 980-8578, Japan. [b] Tokyo Univ. of Science, Department of Chemistry, Tokyo 162-8601, Japan.

16:55 IV-5_15/O
Impact of crystallinity and morphology on diffusion of hydrogen in WO_3 thin films investigated by in situ transmission spectroscopy
Simon Burkhardt [a], Matthias T. Elm [a, b], Bernhard Lani-Wayda[c], Peter J. Klar[a]*
[a] Justus Liebig University, Institute of Experimental Physics I, Heinrich-Buff-Ring 16, 35392 Giessen, Germany. [b] Justus Liebig University, Institute of Physical Chemistry, Heinrich-Buff-Ring 17, 35392 Giessen,

Germany. [c] Justus Liebig University Giessen, Mathematical Institute, Arndtstrasse 2, 35392 Giessen, Germany

17:15 IV-5_16/O
Unraveling the Heterogeneous Nature of Fe-N-C Oxygen Reduction Catalysts via Complementary Advanced Characterization Techniques
Michael J. Dzara[a], Chilan Ngo[a], Matthew B Strand[a], Jaime C. Hagen[a], Michael J. Workman[b], Plamen Atanassov [b], Kateryna Artyushkova[b], and Svitlana Pylypenko[a]
[a] Colorado School of Mines, Department of Chemistry, 1012 14th St. Golden CO 80401, USA. [b] University of New Mexico, Center for Micro-Engineered Materials, Department of Chemical and Biological Engineering, Albuquerque, NM 87131, USA.

17:35 IV-5_17/O
Synthesis, characterization and Ion dynamic studies of (1-x)Pb(NO$_3$)$_2$: xAl$_2$O$_3$ composite solid electrolyte systems
Govinda Reddy Yarava[1,4], Sadananda Chary. A[1], Awasti A. M[2], Narender Reddy Sattineni[3]
1. Department of Physics, University college of Science, Osmania University, Hyderabad, India. 2. Thermodynamics Lab, UGC-DAE Consortium, Indore, India. 3. Department of Physics, University college of Engg. (A), Osmania University, Hyderabad, India. 4. Department of Physics, Vardhaman college of Engineering, Shamshabad, Hyderabad, India.

17:55 IV-5_18/I
PEFC Cathode Catalyst Layer Electrode Microstructure Analysis and Transport Modeling
Deborah J. Myers
Argonne National Laboratories, IL, USA.

IV-6 – SYNCHROTRON AND NEUTRON TECHNIQUES FOR THE STUDY OF ION-CONDUCTING MATERIALS

A. Padova Fiere

Room A6

IV-6/1: **OPERANDO Batteries Session 1**

Chairman: Sandrine Lyonnard

9:00 IV-6_1/K
Structure and Ion Transport in Energy Storage Systems
Michael F. Toney
Stanford Synchrotron Radiation Lightsource, SLAC National Acceleratory Laboratory, 2575 Sand Hill Road, Menlo Park, Ca, 94025, USA.

9:30 IV-6_2/I
Operando synchrotron techniques for the study of electrode materials in Li-ion batteries on the French beamlines at the ESRF
Samuel Tardif
Institute for Nanosciences and Cryogenics, CEA and University Grenoble-Alps, F-38054 Grenoble, France.

9:55 IV-6_3/I
***Operando* characterization of batteries using XAS: advances at the beamline XAFS at synchrotron Elettra**
Giuliana Aquilanti[a], Marco Giorgetti[b], Lorenzo Stievano[c], Robert Dominko[d], Iztok Arčon[e, f], Nicola Novello[a], and Luca Olivi [a]
[a] Elettra – Sincrotrone Trieste, s. s. 14, km 163. 5, 34149 Basovizza, Trieste, Italy. [b] University of Bologna – Department of Industrial Chemistry "Toso Montanari", Viale del Risorgimento, 4, 40136 Bologna, Italy. [c] Université de Montpellier - Institut Charles Gerhardt - AIME, UMR CNRS 5253, Place E. Bataillon, F-34095 Montpellier Cedex 5, France. [d] National Institute of Chemistry, Department of Materials Chemistr, y Hajdrihova 19, SI-1000 Ljubljana, Slovenia. [e] University of Nova Gorica, Vipavska 13, 5000 Nova Gorica, Slovenia. [f] Institut Jožef Stefan, Jamova 39, 1000 Ljubljana, Slovenia.

10:20 IV-6_4/O
Operando X-ray Absorption and Diffraction Insights into High-Rate Electrochemical Energy Storage in Complex Metal Oxides
Kent J. Griffith, Clare P. Grey
University of Cambridge, Department of Chemistry, Lensfield Road CB2 1EW, United Kingdom.

10:40 BREAK

IV-6/2: **OPERANDO Batteries Session 2**

Chairman: Sandrine Lyonnard

11:00 IV-6_5/I
Operando synchrotron and neutron based techniques to probe battery materials
Claire Villevieille
Paul Scherrer Institute – Electrochemistry Laboratory, 5232 Villigen, PSI, Switzerland.

11:25 IV-6_6/I
Operando X-ray investigations of Solid Oxide Fuel Cell Cathode and Anode Model Interfaces
Vedran Vonk[a], Sergey Volkov[a], Jürgen Fleig[b], Andreas Stierle[a]
[a] DESY Nanolaboratory, Deutsches Elektronen-Synchrotron (DESY) Notkestrasse 85, 22607 Hamburg, Germany. [b] Institute of Chemical Technologies and Analytics Vienna University of Technology Getreidemarkt 9/164EC 1060 Vienna, Austria.

11:50 IV-6_7/O
Operando Structural Evolution of Silicon Nanoparticles Anodes for Lithium-Ion Batteries by Small-Angle Neutron Scattering
Coraline Millot[a, b], Jean-Francois Colin [b], Hakima Mendil-Jakani[a], Lionel Porcar [c], Sandrine Lyonnard[a]
[a] INAC/SyMMES – UMR-5819, CEA-CNRS-UJF, 17 Rue de Martyrs, 38054 Grenoble, France. [b] LITEN – CEA, 17 Rue de Martyrs, 38054 Grenoble, France. [c] Institut Laue Langevin, 6 Rue Jules Horowitz, 38000 Grenoble, France.

12:10 IV-6_8/I
Advanced Operando Characterization of positive electrode materials for Na-ion batteries: the case of fluorophosphates
Matteo Bianchini[a], Penghao Xiao[a], Yan Wang[b], Gerbrand Ceder[a], Francois Fauth [c], Emmanuelle Suard[d], Laurence Croguennec[e], Christian Masquelier[f]
[a] Lawrence Berkeley National Lab, MSD, Berkeley, 94720, CA. [b] Samsung Research America, Burlington, 01803, MA. [c] CELLS-ALBA Synchrotron, E-08290 Cerdanyola del Vallès, Spain. [d] Institut Laue-Langevin, 71 Avenue des Martyrs, F-38000 Grenoble, France. [e] CNRS, Univ. Bordeaux, Bordeaux INP, ICMCB UPR 9048, F-33600 Pessac, France. [f] LRCS, Université de Picardie Jules Vernes, F-80039 Amiens, France.

12:35 LUNCH

IV-6/3: **Dynamics Session 1**

Chairman: Alexei Sokolov

14:20 IV-6_9/I
Quasi-Elastic Neutron Scattering Studies on Solid Electrolytes for solid state Lithium Batteries
Didier Blanchard, Jon Steinar Gardarsson Myrdal, Dadi Sveinbjornsso, Tejs Vegge
Department of Energy, Technical University of Denmark, Denmark.

14:45 IV-6_10/I
Fast Ionic Conductors with Structural Instabilities
Sergey Danilkin
Australian Nuclear Science and Technology Organization, Australian Centre for Neutron Scattering, New Illawarra Rd, Lucas Heights, 2234 NSW, Australia

15:10 IV-6_11/O
Investigation of Oxide Ion Conduction via Combined Neutron Scattering Techniques and Molecular Dynamics
Joseph Peet[a], Mark Johnson[a], Andrea Piovano[a], Ivana Evans[b]
[a] Institut Laue-Langevin, 71 Avenue des Martyrs, 38000 Grenoble, France. [b] Durham University, Department of Chemistry, South Road, Durham DH1 3LE, UK.

15:30 IV-6_12/O
Proton sites and proton vibrational dynamics in Sc- and In-doped $BaZrO_3$
Laura Mazzei[a], Adrien Perrichon[a], Alessando Mancini[b], Lorenzo Malavasi[b], Stewart F. Parker[c], Lars Börjesson[a], and Maths Karlsson[a].
[a] Chalmers University of Technology, Department of Physics, 41296 Göteborg, Sweden. [b] University of Pavia & INSTM, Department of Chemistry, 27100 Pavia, Italy. [c] Rutherford Appleton Laboratory, ISIS Facility, Oxfordshire OX11 0QX, United Kingdom.

15:50 BREAK

IV-6/7: **Dynamics Session 2**

Chairman: Alexei Sokolov

16:15 IV-6_13/I
Localized proton motions in acceptor-doped barium zirconates investigated with neutron scattering techniques
Daria Noferini [a, b], Michael Marek Koza [b], Maths Karlsson[a]
[a] Department of Physics, Chalmers University of Technology, SE-412 96 Göteborg, Sweden. [b] Institut Laue-Langevin, 71 Avenue des Martyrs, 38000 Grenoble, France.

16:40 IV-6_14/O
Inelastic Neutron Scattering Studies of δ-Bi_2O_3-related Oxide-ion Conductors
Chris D Ling[a], Julia Wind[a], Richard Mole[b]
[a] The University of Sydney, School of Chemistry, Sydney 2006, Australia. [b] ANSTO, Australian Centre for Neutron Scattering, Menai 2234, Australia.

17:00 IV-6_15/O
Lattice dynamics modified by excess oxygen in Nd_2NiO_{4+d}: triggering low-temperature oxygen diffusion
A. Piovano,[a] A. Perrichon,[b] M. Ceretti,[c] M. Boehm,[a] M. Zbiri,[a] M. Johnson,[a] and W. Paulus [c]
[a] Institut Laue-Langevin, 71 Avenue des Martyrs, 38000 Grenoble, France. [b] Department of Applied Physics, Chalmers University of Technology, SE-412 96 Goteborg, Sweden. [c] University of Montpellier-2, UMR 5253, ICGM, C2M, CC1504, 5 Place Eugène Bataillon, 34095 Montpellier, France.

17:20 IV-6_16/O
Ionic diffusion in Na-battery materials studied by neutron scattering
Fanni Juranyi[a], Marisa Medarde[b], Cyril Marino[c], Ekaterina Pomjakushina[b], Jorge Gavilano[a], Jun Sugiyama[d], Katharina Rolfs[b], Claire Villevieille[c], Martin Månsson[e]
[a] Paul Scherrer Institut, Laboratory for neutron Scattering, Villigen PSI, Switzerland. [b] Paul Scherrer Institute, Laboratory for Development and Methods, Villigen PSI, Switzerland. [c] Paul Scherrer Institute, Electrochemistry Laboratory, Villigen PSI, Switzerland. [d] Toyota Central Research and Development Laboratories, Inc., Nagakute, Aichi, Japan. [e] KTH Royal Institute of Technology, Department of Materials and Nanophysics, Kista, Sweden.

A. Padova Fiere

P area

POSTER SESSION 1 (S1)

Chairmen: Vito Di Noto, Harry L. Tuller

18:20 - 20:00 Poster Session 1

Oral Presentations

TUESDAY June 20, 2017

PLENARY

A. Padova Fiere

Room A1

Chairman: Joachim Maier

8:00 P2 – Masakazu Aono
New Horizons Opened by Novel Solid State Nanoionic Devices and Systems
Masakazu Aono
International Center for Materials Nanoarchitectonics (MANA), Japan.

8:45 BREAK

MACRO AREA 1: IONICS IN ENERGY AND ENVIRONMENT

I-1 – BEYOND LITHIUM BATTERIES: IONIC TRANSPORT IN POST-LI SYSTEMS

B. Fiore di Botta

Room B2

I-1/5

Chairmen: Maximilian Fichtner, Corsin Battaglia

9:00 I-1_17/I
Non-aqueous aluminium batteries: progress and challenges
Kostiantyn Kravchyk[a, b], Shutao Wang[a, b] and Maksym Kovalenko[a, b]
[a] Institute of Inorganic Chemistry, Department of Chemistry and Applied Biosciences, ETH, Zürich, CH-8093 Zürich, Switzerland. [b] Empa – Swiss Federal Laboratories for Materials Science and Technology, CH-8060, Dübendorf, Switzerland.

9:25 I-1_18/I
Phenomenological Transition of Aluminum Surface from a Passive to an Active state in Organic Electrolytes and Ionic Liquid - A Beneficial Implementation in Batteries?
Yair Ein-Eli [a,b]
[a] Department of Materials Science and Engineering, Technion - Israel Institute of Technology, Haifa Israel 3200003. [b] The Nancy and Stephen Grand Technion Energy Program, Technion- Israel Institute of Technology, Haifa Israel 3200003.

9:50 I-1_19/I
Inorganic crystalline solids with utilizable Al^{3+} mobility
Tina Nestler[a], Falk Meutzner[a], Artem Kabanov[b], Matthias Zschornak[a], Tilmann Leisegang[a,b], Vladislav A. Blatov[b], Dirk C. Meyer[a]
[a] Institute of Experimental Physics, TU Bergakademie Freiberg, Freiberg, Germany. [b] Samara Center for Theoretical Materials Science, Samara State Aerospace University, Samara, Russia.

10:15 I-1_20/O
The influence of water on the electrical conductivity of aluminum-substituted lithium titanium phosphate
Enkhtsetseg Dashjav [a], Qianli Ma [a], Qi Xu [a], Chih-Long Tsai [a], Marco Giarola [b], Gino Mariotto [b], Frank Tietz [a,c]
[a] Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, IEK-1, D- 52425 Jülich, Germany. [b] Università di Verona, Dipartimento di Informatica, Strada Le Grazie 15, I-37134 Verona, Italy.

(c) Helmholtz-Institute Münster, Forschungszentrum Jülich GmbH, D-52425 Jülich, Germany.

10:35 BREAK

I-1/6

Chairmen: Maximilian Fichtner, Corsin Battaglia

11:00 I-1_21/I (cancelled)
Electrospun Electrolytes and Electrodes for Li-ion Batteries
Fausto Croce
Università "G. d'Annunzio" Chieti-Pescara, Via dei Vestini, 31 – 66100 Italy.

11:25 I-1_22/I
Highly safe electrolytes in lithium-metal and lithium-ion batteries
Jusef Hassoun
Department of Chemical and Pharmaceutical Sciences, University of Ferrara, Via Fossato di Mortara, 44121, Ferrara, Italy

11:50 I-1_23/O
Mechanistic insights into sodium intercalation in γ'-V_2O_5 cathode using in situ operando Raman spectroscopy
Marianne Safrany Renard[a], Boris N. Slautin[b], Rita Baddour-Hadjean[a], Dmitry V. Pelegov[b], Jean-Pierre Pereira-Ramos[a]
[a] Institut de Chimie et des Matériaux Paris est, GESMAT, UMR 7182 CNRS-Université Paris Est, 2-8 rue Henri Dunant, 94320 Thiais, France. [b] Institute of Natural Sciences, Ural Federal University, Ekaterinburg, Russia.

12:10 I-1_24/O
Anomalous Charge-Discharge Mechanism of Rock-Salt Lithium Titanium Sulfides
Atsushi Sakuda[a], Koji Ohara[b,c], Tomoya Kawaguchi[b], Katsutoshi Fukuda[b], Hajime Arai[b], Yoshiharu Uchimoto[d], Zempachi Ogumi[b],Hironori Kobayashi[a], Masahiro Shikano[a], Hikari Sakaebe[a], Tomonari Takeuchi[a]
[a] National Institute of Advanced Industrial Science and Technology (AIST), Research Institute of Electrochemical Energy, Department of Energy and Environment, 1-8-31 Midorigaoka, Ikeda, Osaka, 563-8577, Japan. [b] Kyoto University, Office of Society-Academia Collaboration for Innovation, Gokasho, Uji, Kyoto, 611-0011, Japan. [c] Japan Synchrotron Radiation Research Institute (JASRI), The Research & Utilization Division, 1-1-1 Kouto, Sayo, Hyogo, 679-5198, Japan. [d] Kyoto University, Graduate School of Human and Environmental Studies, Nihonmatsu-cho, Yoshida, Sakyo-ku, Kyoto, 606-8317, Japan.

12:30 I-1_25/O
Kinetic Analysis of Graphitized-Carbon Reactions in Li-ion cells before and after Degradation
Omar S. Mendoza-Hernandez[a], Eiji Hosono[b], Daisuke Asakura[b], Hirofumi Matsuda[b], Yoshitsugu Sone[c,d] and Minoru Umeda[a]
[a] Nagaoka University of Technology, Department of Materials Science and Technology, 1603-1 Kamitomioka, Nagaoka, Niigata 940-2188, Japan. [b] Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology, (AIST) 1-1-1 Umezono, Tsukuba, Ibaraki 305-8568, Japan. [c] Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science, 3-1-1 Yoshinodai, Chuo-ku, Sagamihara, Kanagawa 252-5210, Japan. [d] The Graduate University of Advanced Studies, SOKENDAI, 3-1-1 Yoshinodai, Chuo-ku, Sagamihara, Kanagawa 252-5210, Japan.

12:50 LUNCH

I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS

Fiore di Botta

Room B7

I-2/8

Chairmen: Doron Aurbach, Craig A. J. Fisher

9:00 I-2_31/K
The true horizon for advanced rechargeable batteries
Doron Aurbach
Bar-Ilan University, Department of Chemistry, Ramat-Gan 52900002 Israel.

9:30 I-2_32/O
Disordered Rock Salt type Structure as New Active Compound for High Energy Density Batteries
M. Freire, E. Adamczyk, E. Anger and V. Pralong
Laboratoire de Cristallographie et Sciences des Matériaux CRISMAT, ENSICAEN, Université de Caen, CNRS, 6 Bd Maréchal Juin, 14050 Caen, France.

9:50 I-2_33/O
Crystal chemistry of New $LiVPO_4F_{1-x}O_x$ Tavorite-type compositions: from long range average structure to local environments.
Edouard Boivin[a, b, f], Rénald David[b, f], Jean-Noël Chotard[b, f], Michel Ménétrier[a, f], Lydie Bourgeois[c], Tahya Bamine[a, f], François Fauth[d], Antonella Iadecola[e, f], Dany Carlier[a, f], Christian Masquelier[b, f], and Laurence Croguennec[a, f]
[a] ICMCB-CNRS, Université de Bordeaux, Bordeaux INP, Pessac (France). [b] LRCS, CNRS-UMR#7314, Université de Picardie Jules Verne, Amiens (France). [c] Université de Bordeaux, ISM, Groupe Spectroscopie Moléculaire, Talence (France). [d] CELLS - ALBA synchrotron, Cerdanyola del Vallès, E-08290, Barcelona (Spain). [e] SOLEIL Synchrotron - Gif-sur-Yvette (France). [f] Réseau sur le Stockage Electrochimique de l'Energie (RS2E), FR CNRS 3459 (France).

10:10 I-2_34/O
The role of surface diffusion during phase separation in Li_xFePO_4
Yiyang Li[a], Hungru Chen[b], Kipil Lim[a], Jongwoo Lim[a], Peter Attia[a], Sang Chul Lee[a], Norman Jin[a], Zixuan Guan[a], Jihyun Hong[a], Young Sang Yu[c], M. Saiful Islam[b], Martin Z. Bazant[c], William C. Chueh[a]
[a] Stanford University, Stanford, CA, USA. [b] University of Bath, Bath, UK. [c] Lawrence Berkeley National Laboratory, Berkeley, CA, USA. [d] Massachusetts Institute of Technology, Cambridge, MA, USA.

10:30 BREAK

I-2/9

Chairmen: Doron Aurbach, Stefano Passerini

11:00 I-2_35/I
$Li_xNi_{0.5}Mn_{1.5}O_4$ spinel as promising high voltage and high capacity cathode material for lithium ion batteries
P. Axmann, M. Mancini, G. Gabrielli, P. Balasubramanian, M. Wohlfahrt-Mehrens
ZSW – Zentrum für Sonnenenergie- und Wasserstoffforschung, Baden-Württemberg, Helmholtzstrasse 8, D-89081Ulm, Germany.

11:25 I-2_36/O
Dynamic, Reversible Oxygen Redox as a Mediator of Unusual Electrochemistry in Lithium-Rich Layered Oxide Electrodes
William E. Gent[a,b], Kipil Lim[a,c], Yufeng Liang[b], Jihyun Hong[a,c], Mitchell McIntire[a], Qinghao Li[b], Sung-Jin Ahn[d], Jay Heok Song[d], Jin-Hwan Park[d], Seok-Kwang Doo[d], David Kilcoyne[b], David Vine[b], Apurva Mehta[c], Stefano Ermon[a], Wanli Yang[b], David Prendergast[b], Michael F. Toney[c], and William C. Chueh[a,c]
[a] Stanford University, Stanford, CA, U.S.A. [b] Lawrence Berkeley National Laboratory, 1 Cyclotron Road, Berkeley, CA, U.S.A. [c] SLAC National Accelerator Laboratory, 2757 Sand Hill Road Menlo Park, CA, U.S.A. [d] Energy Lab., Samsung Advanced Institute of Technology, 130, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, South Korea.

11:45 I-2_37/O
Full Picture Discovery for Mixed-Fluorine Anion Effects on High-Voltage Spinel Manganese Cathodes
Nobuyuki Zettsu[a, b], Dae-wook Kim[b], Hiromasa Shiib[b], Katsuya Teshima[a, b]
[a] Center for Energy & Environmental Science, Shinshu University, 4-17-1 Wakasato, Nagano 380-8553, Japan. [b] Department of Materials Chemistry, Faculty of Engineering, Shinshu University, 4-17-1 Wakasato, Nagano 380-8553, Japan.

12:05 I-2_38/O
Particulized AlF_3 *via* Atomic Layer Deposition (ALD) Coating of 5 V Cathode Materials
Alon Shapira[a], Haika Dresner[a], Alexander Kraytsberg[a], and Yair Ein-Eli[a, b]
[a] Department of Materials Science and Engineering, Technion - Israel Institute of Technology, Haifa Israel 3200003. [b] The Nancy and Stephen Grand Technion Energy Program, Technion- Israel Institute of Technology, Haifa Israel 3200003.

12:25 I-2_39/O
Direct observation of oxygen anion redox reaction in Li-rich layered manganese oxides
Masatsugu Oishi[a], Keisuke Yamanaka[b], Iwao Watanabe[c], Yoshiharu Uchimoto[d], Toshiaki Ohta[b]
[a] Institute of Science and Technology, Tokushima University, 770-8506, Japan. [b] SR Center, Ritsumeikan University, 525-8577, Japan. [c] Office of Society-Academia Collaboration for Innovation, Kyoto University, 611-0011, Japan. [d] Graduate School of Human and Environmental Studies, Kyoto University, 606-8501, Japan.

12:45 LUNCH

I-2/10

Chairmen: Elena Arroyo-deDompablo, Cristina Tealdi

14:20 I-2_40/I
Structural and ionic transport properties of LISICON and NASICON solid electrolyte materials
Christian Masquelier[a, c], Yue Deng[a, b, c], Christopher Eames[b], Oliver Pecher[d], Benoit Fleutot[a, c], Jean-Noël Chotard[a, c], Clare P. Grey[d], M. Saiful Islam[b]
[a] LRCS, Université de Picardie Jules Verne, UMR CNRS 7314, 33 rue Saint Leu, Amiens, France. [b] Department of Chemistry, University of Bath, Bath, BA2 7AY, United Kingdom. [c] RS2E, Réseau sur le Stockage Électrochimique de l'Énergie, CNRS 3459, Amiens, France. [d] Department of Chemistry, University of Cambridge, Cambridge, CB2 1EW, UK.

14:45 I-2_41/O
Novel Alkali Superionic Conductor Solid Electrolytes for All-Solid-State Rechargeable Alkali-Ion Batteries
Shyue Ping Ong
Department of NanoEngineering, University of California, San Diego, 9500 Gilman Drive, Mail Code 0448, La Jolla, CA 92093, USA.

15:05 I-2_42/O
Composition Tuning in Anti-Perovskite Solid Electrolytes and Their Interfaces
James A. Dawson, Hungru Chen and M. Saiful Islam
Department of Chemistry, University of Bath, Bath BA2 7AY, United Kingdom.

15:25 I-2_43/O
STEM investigation on topochemical formation interface of $Li_{0.16}La_{0.62}TiO_3$ electrolyte
Mehmet Ali Gulgun[a, b], Aslihan Orum[c], Sorour Semsari Parapari[a], Melike Mercan Yildizhan[a], Meltem Sezen[b], Kazumasa Takatori[d], Hiroaki Kadoura[d], Masamichi Yoshimura[c], Toshihiko Tani[c, d]
[a] Sabanci University, Faculty of Engineering and Natural Sciences, Istanbul 34956, Turkey. [b] Sabanci University Nanotechnology Application Center, Istanbul 34956, Turkey. [c] Toyota Technological Institute, Nagoya 468-8511, Japan. [d] Toyota Central Research and Development Laboratories, Inc., Nagakute 480-1192, Japan.

15:45 BREAK

I-2/11

Chairmen: Shyue Ping Ong, Cristina Tealdi

16:15 I-2_44/I
Alluaudites as Battery Electrode Framework
Atsuo Yamada[a, b]
[a]Department of Chemical System Engineering, The University of Tokyo, Bunkyo-ku, Tokyo 113-8656, Japan. [b]Elements Strategy Initiative for Catalysts & Batteries (ESICB), Kyoto University, Nishikyo-ku, Kyoto 615-8245, Japan.

16:40 I-2_45/O
New Solid State Lithium Ion Conductors based on the Olivine and Perovskite Structures
Leopoldo Enciso-Maldonado[a], Alma B. Santibáñez-Mendieta[a], Christophe Didier[a], Kenneth K. Inglis[a, b], Michael D. Jones[a, b], Julia L. Payne[a], Mona K. Omir[a, b], Alex J. Corkett[a], Michael J. Pitcher[a], Marco Zanella[a], Felix J. Shin[a], Luke M. Daniels[a], Aydar Rakhmatullin[c], Pierre Florian[c], Ming Li[d], Matthew S. Dyer[a], John B. Claridge[a], Frédéric Blanc[a, b], Matthew J. Rosseinsky[a]
[a] Department of Chemistry, University of Liverpool, UK. [b] Stephenson Institute for Renewable Energy, University of Liverpool, UK. [c] CNRS Orléans, France. [d] Faculty of Engineering, University of Nottingham, UK.

17:00 I-2_46/O
Unreported manganese silicate material as positive electrode for lithium-ion batteries
Lefèvre Guillaume[a], Ducros Jean-Baptiste[a], Boulineau Adrien[b], Benayad Anass[b], Martinet Sébastien[a]
[a] CEA LITEN – Département Electricité et Hydrogène pour les Transports, 17 Rue des Martyrs 38054 Grenoble Cedex 9, France. [b] CEA LITEN – Département Technologies pour les NanoMatériaux, 17 Rue des Martyrs 38054 Grenoble Cedex 9, France.

17:20 I-2_47/O
Improvements to High Voltage Electrode Materials for Higher Performance and Improved Manufacturing
James Trevey, Paul Lichty, Arrelaine Dameron, and David King
Forge Nano, 1172 Century Drive Ste 240, Louisville, CO 80027 USA.

17:40 I-2_79/I
Alkali and transition metal fluoride-phosphates as perspective cathode materials for metal-ion batteries
*Evgeny V. Antipov[a] *, Stanislav S. Fedotov[a], Victoria A. Nikitina[a], Nellie R. Khasanova[a], Artem M. Abakumov[b,a], Keith Stevenson [b]*
[a] M.V. Lomonosov Moscow State University, Leninskie Gory 1/3, Moscow, 119991, Russia
[b] Skolkovo Institute of Science and Technology, Moscow, 143026, Russia

I-3 – ALL SOLID-STATE BATTERIES

B. Fiore di Botta

Room B1

I-3/9: **BATTERY SESSION 1**

Chairmen: Carl Thompson, Yasutoshi Irayama

9:00 I-3_36/I
All-Solid-State Li-ion Batteries for Transformational Energy Storage
Eric D. Wachsman
University of Maryland Energy Research Center, University of Maryland, College Park, MD.

9:25 I-3_37/O
Improvements to All-Solid-State Batteries for Higher Performance and Commercialization
James E. Trevey and David M. King
Forge Nano, 1172 Century Drive Ste 240, Louisville, CO 80027 USA.

9:45 I-3_38/O
An all-solid-state half-cell battery with lithium amide-borohydride solid-state electrolyte
Arndt Remhof[1], Yigang Yan[1], Ruben-Simon Kühnel[1], Léo Duchêne[1], Elsa Roedern[1], Daniel Rentsch[1], Zbigniew Łodziana[2], and Corsin Battaglia[1]
[1] Empa, Swiss Federal Laboratories for Materials Science and Technology, 8600 Dübendorf, Switzerland. [2] Institute of Nuclear Physics, Polish Academy of Sciences, PL-31-342 Kraków, Poland.

10:05 I-3_39/O
Grain and grain boundary ionic conductivity of solid electrolytes under realistic battery operation conditions
Andreas Mertens[a,b,c], Shicheng Yu[a,c],Hermann Tempel[a], Deniz Gündüz[a,c], Roland Schierholz[a], Josef Granwehr[a,d], Hans Kungl[a], Rüdiger-A. Eichel[a,c,e]
[a] Forschungszentrum Jülich, Institute of Energy and Climate Research – Fundamental Electrochemistry (IEK-9), 52425 Jülich, Germany. [b] Helmholtz-Institute Münster (Hi MS) – Ionics in Energy Storage, 48149 Münster, Germany. [c] RWTH Aachen University, Institute of Physical Chemistry, 52074 Aachen, Germany. [d] RWTH Aachen University, Institute of Technical and Macromolecular Chemistry, 52074 Aachen, Germany. [e] Jülich Aachen Research Alliance (JARA), Section JARA-Energy, 52425 Jülich, Germany.

10:25 I-3_40/O
Mechanical stability of all-solid-state lithium-ion batteries
Giovanna Bucci, Tushar Swamy, Yet-Ming Chiang, W. Craig Carter
Massachusetts Institute of Technology, Department of Materials Science and Engineering, 77 Massachusetts Ave. 02139 Cambridge MA, USA.

10:45 BREAK

I-3/10: **BATTERY SESSION 2**

Chairmen: Carl Thompson, Yasutoshi Irayama

11:00 I-3_41/I
All Solid State Li-Ion Batteries Based on Li-Garnet Electrolyte
Michal Struzik[a,b], RetoPfenninger[a,b], Inigo Garbayo[a],Semih Afyon[a], Jennifer L.M. Rupp[b]
[a] ETH Zurich, Department of Materials, Hoenggerbergring 64, Switzerland. [b] Massachusetts Institute of Technology, Department of Material Science and Engineering, 77 Massachusetts Ave., Cambridge, Massachusetts, United States.

11:25 I-3_42/O
***In situ* and *Ex situ* Observations of Solid-State Electrochemical Reactions in Li-ion Batteries by Advanced Electron Microscopy**
Kazuo Yamamoto, Tsukasa Hirayama
Japan Fine Ceramics Center, Nanostructures Research Laboratory, 2-4-1 Mutsuno Atsuta-ku Nagoya Aichi 456-8587, Japan.

11:45 I-3_43/O
Battery Electrode Analysis by Tomography Methods
J. Joos, P. Braun, J. Costard, A. Weber, E. Ivers-Tiffée
Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), Adenauerring 20b, D-76131, Karlsruhe, Germany.

12:05 I-3_44/O
Li–ion batteries based on hybrid organic-inorganic composite/electrolytes.
Rajendra Kumar Singh
Department of Physics, Banaras Hindu University, Varanasi 221005, India.

12:25 I-3_45/O
Solid State Lithium Thin Film Battery Composed of $Li_4Ti_5O_{12}$ Anodes with a Solid Garnet $Li_{6.25}Al_{0.25}La_3Zr_2O_{12}$ Electrolyte
Reto Pfenninger[a,b], Semih Afyon[a], Michal Struzik[a,b], Inigo Garbayo[a]and Jennifer L.M Rupp[a,b]
[a] ETH Zurich, Electrochemical Materials, 8093 Zurich, Switzerland. [b] Massachusetts Institute of Technology, Department of Material Science and Engineering, 77 Massachusetts Ave., Cambridge, Massachusetts, United States.

12:45 LUNCH

I-3/11: **BATTERY SESSION 3**

Chairmen: Jürgen Janek, Martin Wilkening

14:15 I-3_46/I
New Scalable Fabrication of Electrodes for All-Solid-State Lithium-Ion Batteries
Yoon Seok Jung
School of Energy and Chemical Engineering, Department of Energy Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan 44919, Republic of Korea.

14:40 I-3_47/O
Li Transfer in Amorphous to Crystalline $Li_7La_3Zr_2O_{12}$ Garnet Thin Films for All-Solid-State Battery Electrolytes
Iñigo Garbayo[a], Michal Struzik[a,b], William J. Bowman[a,c], Reto Pfenninger[a,b], Evelyn Stilp[a,d], Jennifer L.M. Rupp[a,b]
[a] Electrochemical Materials, Department of Materials, ETH Zürich. Hönggerbergring 64, Zürich, 8093, Switzerland. [b] Department of Materials Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., 13-3066, Cambridge, MA, 02139, USA. [c] Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., 13-3066, Cambridge, MA, 02139, USA. [d] Materials for Energy Conversion, Empa. Überlandstrasse 129, Dübendorf, 8600, Switzerland.

15:00 I-3_48/O
A dual-ion micro-battery based on $LiMn_2O_4$ and Zinc for micro-energy applications
Rafael Trocoli[a], Alfonso Sepulveda[b], Alex Morata[a], and Albert Tarancón[a]
[a]*IREC, Jardins de les Dones de Negre 1, 2a 08930 Sant Adri´a de Bes´os, Barcelona, Spain.* [b]*Imec, Kapeldreef 75, B-3001 Leuven, Belgium.*

15:20 I-3_49/O
Ultra-thin film metal oxide battery
Aik Jun Tan[a], Mantao Huang[a], Max Mann[a], Isaac Weaver[b], Geoffrey Beach[a]
[a] Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139, USA. [b] MIT Lincoln Laboratory, Lexington, Massachusetts 02421-6426, USA.

15:40 I-3_50/O
In-plane orientation alignment of $LiCoO_2$ epitaxial films
Kazunori Nishio[b], Tsuyoshi Ohnishi[a], Kazutaka Mitsuishi[a], Narumi Ohta[a], Ken Watanabe[c], Kazunori Takada[a]
[a] National Institute for Materials Science, 305-0044, Japan. [b] Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 980-8577, Japan. [c] Department of Molecular and Material Science, Kyushu University, 816-8580, Japan.

16:00 BREAK

I-3/12: **BATTERY SESSION 4**

Chairmen: Jürgen Janek, Martin Wilkening

16:20 I-3_51/I
Stress evolution, cyclability, and charge capacity of germanium and silicon thin film anodes
A. Al-Obeidi[1,2], Daniele Perego[3,4], D. Kramer[5], R. Mönig[5], and C.V. Thompson[1,3]
[1] Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA. [2] Current address: Ionic Materials Inc., Woburn, MA, USA. [3] Singapore-MIT Alliance for Research and Technology, Program for Low Energy Electronic Systems, Singapore. [4] Current address: Paul Scherrer Institute, Villigen, Switzerland. [5] Institute for Applied Materials, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany.

16:45 I-3_52/O
Laser flash sintering of $LiCoO_2$ cathode on LTAP solid electrolyte for all solid-state batteries
Koichi Hamamoto, Yuki Yamaguchi, Hiroyuki Shimada, Hirofumi Sumi, Toshiaki Yamaguchi and Yoshinobu Fujishiro
National Institute of Advanced Industrial Science and Technology (AIST), Inorganic Functional Materials Research Institute, 2266-98, Shimo-shidami, Moriyama-ku, Nagoya 463-8560, Japan.

17:05 I-3_53/O
5 V all-solid-state thin-film battery with Li_xCoMnO_4 prepared by PLD and post annealing
Norikazu Ishigaki, Naoaki Kuwata, Junichi Kawamura
Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Katahira 2-1-1, Aobaku, Sendai, 980-8577, Japan.

17:25 I-3_54/O
Epitaxial vs Polycrystalline $Li_4Ti_5O_{12}$ thin-film battery anodes and the role of grain boundaries on Li-ion conductivity
Francesco Pagani[a,b], Evelyn Stilp[a], Reto Pfenninger[b,c], Arndt Remhof[a], Antonia Neels[a], Max Döbeli[d], Corsin Battaglia[a], and J.L.M Rupp[b,c]
[a] Empa, Swiss Federal Laboratories for Materials Science and Technology, 8600 Dübendorf, Switzerland. [b] ETH Zurich, Electrochemical Materials, 8093 Zurich, Switzerland. [c] Massachusetts Institute of Technology, Department of Material Science and Engineering, 77 Massachusetts Ave., Cambridge, Massachusetts, United States. [d] ETH Zurich, Ion Beam Physics, 8093 Zurich, Switzerland.

17:45 I-3_55/O
An All Solid State Thin Film Li-Garnet Microbattery: Composed of Li_7MnN_4 Anode, $Ni_{0.8}Co_{0.15}Al_{0.05}O_2$ Cathode and $Li_{6.25}Al_{0.25}La_3Zr_2O_{12}$ Electrolyte Films
Reto Pfenninger[a,b], Michal Struzik[a,b], Inigo Garbayo[a], and Jennifer L.M Rupp[a,b]
[a] ETH Zurich, Electrochemical Materials, 8093 Zurich, Switzerland. [b] Massachusetts Institute of Technology, Department of Material Science and Engineering, 77 Massachusetts Ave., Cambridge, Massachusetts, United States.

I-7 – "POLYMER ELECTROLYTES" - THE UBIQUITY OF IONS AND POLYMER MATERIALS IN DEVICES

B. Fiore di Botta

Room B9

I-7/5

Chairman: Jean-Yves Sanchez

9:00 I-7_17/K
Controlling the Microstructure−Electrochemical Performance Interplay in Single-Cation Conducting Polymers *via* Molecular Architecture Design
Cristina Iojoiu [a], Huu Dat Nguyen [a], Sandrine Lyonnard [b], Guk-Tae Kim [c, d], Dominic Bresser [b, c, d], Jean-Yves Sanchez [a]*
[a] Univ. Grenoble Alpes, CNRS, G-INP, LEPMI, Institute of Engineering, Univ. Grenoble Alpes, F-38000 Grenoble, France. [b] INAC, SPrAM, UMR 5819, CEA-CNRS-UJF, 17 rue des Martyrs, F-38054 Grenoble, France. [c] Helmholtz Institute Ulm (HIU), Helmholtzstraße 11, 89081 Ulm, Germany. [d] Karlsruhe Institute of Technology (KIT), P.O. Box 3640, 76021 Karlsruhe, Germany.

9:30 I-7_18/I
A Novel Thermoplastic Polymer and its Performance Characteristics in Li metal Rechargeable Batteries
M. Zimmerman [a], R. Leising [a], M. Gobet [b], M. Berman [b], S. Munoz [b], S.G. Greenbaum [b], Jay Whitacre [c]*
[a] Ionic Materials, Inc., 10M Commerce Way, Woburn, MA 01801, USA. [b] Department of Physics & Astronomy, Hunter College of CUNY, New York, NY 10065, USA. [c] Carnegie Mellon University, Pittsburgh, PA 15213 USA

9:55 I-7_19/I
Different approaches to form stable and effective gel polymer electrolytes for Li-ion and Li-S batteries
Maria Assunta Navarra, Stefania Panero*
Sapienza University of Rome, Department of Chemistry, Piazzale Aldo Moro 5, 00185 Rome, Italy

10:20 I-7_20/O
Poly(vinyl alcohol)-based Electrolyte for Lithium Batteries
*Gioele Pagot [a, b], Federico Bertasi [a, c], Keti Vezzù [a, c], Vito Di Noto [a, b, c]**
[a] Section of "Chemistry for the Technology" ChemTech, Department of Industrial Engineering, University of Padova, Via Gradenigo 6/A Padova, Italy. [b]Centro Studi di Economia e Tecnica dell'Energia Giorgio Levi Cases, Via Marzolo 9 Padova, Italy. [c]INSTM, Via Marzolo 1 Padova, Italy.

10:40 BREAK

I-7/6

Chairman: Michael Hickner

11:00 I-7_21/I
Ohm's Law and Complete Electrochemical Characterization of Block Copolymer Electrolytes
Nitash P. Balsara, Danielle M. Pesko, Irune Villaluenga Ksenia Timachova*
Lawrence Berkeley National Laboratory, University of California, Berkeley, California 94720, USA

11:25 I-7_22/I
Multiscale Morphological and Electrical Characterization of Charge Transport Limitations to Power Performance of Positive Electrode for Li-Ion Batteries
Nicolas Besnard [a, b], Aurélien Etiemble [c], Thierry Douillard [c], Olivier Dubrunfaut [d], Pierre Tran-Van [b], Laurent Gautier [e], Sylvain Franger [f], Jean-Claude Badot [g], Eric Maire [b], Bernard Lestriez [a]
[a] IMN, CNRS, Université de Nantes, Nantes, France. [b] Renault Technocentre, Guyancourt, France. [c] MATEIS, CNRS, INSA Lyon, Université de Lyon, Villeurbanne, France. [d] GeePs, CNRS, CentraleSupélec, Sorbonne Universités, UPMC Univ Paris 06, Univ. Paris-Sud, Université Paris-Saclay, Gif-sur-Yvette, France. [e] Umicore Rechargeable Battery Materials, Brussels, Belgium. [f] ICMMO-ERIEE, CNRS, Université Paris Sud, Orsay, France. [g] Chimie ParisTech, CNRS, Institut de Recherche de Chimie Paris, Paris, France

11:50 I-7_23/O
Ion-Conductive Mechanism of Concentrated Poly(ethylene carbonate)-based Electrolytes for Battery Application
*Kento Kimura, Yoichi Tominaga**
Tokyo University of Agriculture and Technology, Graduate School of Bio-Applications and Systems Engineering, Koganei, Tokyo 184-8588, Japan

12:10 I-7_25/O
Thin and flexible solid-state composite electrolytes composed of organic ionic plastic crystal reinforced with polymer nanofibres
Nahid Iranipour [a], Anthony F. Hollenkamp [b], Maria Forsyth [a], Patrick C. Howlett [a]*
[a] ARC Centre of Excellence for Electromaterials Science – Institute for Frontier Materials, Deakin University, Burwood, Victoria 3125, Australia. [b] Commonwealth Scientific and Industrial Research Organisation, Clayton, Victoria 3168, Australia.

12:30 LUNCH

I-7/7

Chairman: Monika Schönhoff

14:20 I-7_26/I
Extremely-Thin but 3D-Continuous Proton Conduction Pathway
*Takahiro Ichikawa [a, b]**
[a] Department of Biotechnology, Tokyo University of Agriculture and Technology, Nakacho, Koganei, Tokyo 184-8588, Japan. [b] PRESTO, Japan Science and Technology Agency (JST), Honcho, Kawaguchi 332-0012, Japan.

14:45 I-7_27/O
Advanced processing and electrochemical analysis of Nafion electrolyte films for solid-state electrochromic devices fabricated at room temperature on single substrate: from glass to flexible plastic
Pierluigi Cossari [a, b], Alessandro Cannavale [a, c], Salvatore Gambino [a, b], Giuseppe Gigli [a, b]*
[a] CNR Nanotec, Istituto di Nanotecnologia, via Arnesano 73100, Lecce, Italy. [b] Università del Salento, Dipartimento di Matematica e Fisica Ennio De Giorgi, via Arnesano 73100 Lecce, Italy. [c] Politecnico di Bari, Dipartimento di Scienze dell'Ingegneria Civile e dell'Architettura, via Orabona 4, Bari, Italy

15:05 I-7_28/O
Proton conduction pathways in porous organic cage networks and functionalised silica ionogels
*Scott Lewis *, Ming Liu, Matthew Michie, Linjiang Chen, Marc A. Little, Sam Y. Chong, Iain M. Aldous, Tom Hasell, Andrew I. Cooper and Laurence J. Hardwick*
University of Liverpool, Department of Chemistry and Stephenson Institute for Renewable Energy, Crown Street, Liverpool L69 7ZF, U.K.

15:25 I-7_29/O
A novel approach on agarose based proton conducting polymer electrolytes for fuel cell applications
G. Boopathi [a, b], S. Pugalendhi [a], S. Selvasekarapandian [b], S. Monisha [b], P. Subramanian [a]*
[a]Department of Bioenergy, Tamil Nadu Agricultural University, Tamil Nadu-641003, India. [b]Materials Research Center, Coimbatore, Tamil Nadu – 641 045. India.

15:45 BREAK

I-7/8

Chairman: Cristina Iojoiu

16:15 I-7_30/I
Polymeric Gel Electrolytes Based on a Novel Triply Branched Network Polymer for Rechargeable Batteries
Nobuko Yoshimoto*, Kazuhiro Yamabuki, Shogo Okamura, Seiya Tanji, Kenta Fujii, and Masayuki Morita
2-16-1 Tokiwadai, Ube 755-8611, Japa, Yamaguchi University, 2-16-1 Tokiwadai, Ube 755-8611, Japan

16:40 I-7_31/O
New type of gel polyelectrolytes based on polymeric ionic liquids
Sabina Abbrent, Hynek Beneš, Jana Kredatusová, Michal Bláha, Barbora Galajdová*
Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyrovsky Sq. 2, 162 06 Prague 6, Czech Republic

17:00 I-7_32/O
Optimization of the architecture of cationic poly(ionic liquids) and of the lithium salt concentration in polymer gel electrolytes
Marc Brinkkötter [a], Pinchas Nürnberg [a], Elena I. Lozinskaya [b], Denis O. Ponkratov [b], Yakov Vygodskii [b], Alexander S. Shaplov [b, c], Monika Schönhoff [a]
[a]Institute of Physical Chemistry, University of Münster, Corrensstraße 28/30, 48149 Münster, Germany. [b]A.N. Nesmeyanov Institute of Organoelement Compounds russian academy of sciences, (INEOS RAS), Vavilov str. 28, 119991, GSP-1, Moscow, Russia. [c]Luxembourg Institute of Science and Technology (LIST), 5 Avenue des Hauts-Fourneaux, L-4362 Esch-sur-Alzette, Luxembourg.

17:20 I-7_33/O
Combining a Kevlar-Like Polymer with Ionic Liquids to Enable Safer and Higher Density Batteries
*Ying Wang [a], Zhou Yu [a], Yadong He [b], Ying Chen [a], Jianwei Gao [c], Hyun Gook Yoon [d], Liyu Jin [d], Maria Forsyth [d], Rui Qiao [b], Theo J. Dingemans [c] and Louis A. Madsen [a]**
a) Virginia Tech, Department of Chemistry and Macromolecules Innovation Institute, Blacksburg, VA 24061 USA. b) Virginia Tech, Department of Mechanical Engineering, Blacksburg, VA 24061 USA. c) University of North Carolina, Department of Applied Physical Sciences, Chapel Hill, NC 27514 USA. d) Deakin University, Institute for Frontier Materials, Geelong, VIC 3216 Australia.

17:40 I-7_34/O
Novel Polymer Electrolytes with Porous Polymer Monoliths and Ionic Liquids
Masahiro Yoshizawa-Fujita, Kanta Okuda, Yuko Takeoka, Masahiro Rikukawa*
Department of Materials & Life Sciences, Sophia University, 7-1 Kioi-cho, Chiyoda-ku, Tokyo 102-8554, Japan

I-8 – CERAMIC PROTON AND HYDRIDE ION CONDUCTORS

A. Padova Fiere

Room A3

I-8/5

Chairmen: Marie-Laure Fontaine, Glenn Mather

9:00 I-8_19/I
Segmented-in-series proton ceramic fuel cells with tubular geometry
Marie-Laure Fontaine[a], Wen Xing [a], Zuoan Li [a], Christelle Denonville [a], Ragnar Strandbakke [b], E. Vøllestad [b], Dustin R. Beeaff [c], Truls Norby [b], Jose M. Serra [d]*
[a] SINTEF Materials and Chemistry, PO Box 124, Blindern Oslo, Norway. [b] Department of Chemistry, University of Oslo, Centre for Materials Science and Nanotechnology, FERMiO, Gaustadalléen 21, NO-0349 Oslo, Norway. [c] -3CoorsTek Membrane Sciences AS, Gaustadalleen 21, NO-0349 Oslo, Norway. [d] Instituto de Tecnología Química, Av. Naranjos s/n, E-46022 Valencia (SPAIN).

9:25 I-8_20/O
Internal reforming of methane fuel within proton-conducting ceramic fuel cell anode supports
*Long Le, Neal P. Sullivan**
Mechanical Engineering Department, Colorado Fuel Cell Center, Colorado School of Mines, 1500 Illinois Street, Golden, Colorado, USA 80401

9:45 I-8_21/O
TFD study of the hydrogen extraction in MDA process using a co-ionic membrane reactor
D. Catalán Martínez [a], J.M. Serra [a], S. H. Morejudo [b], Christian Kjølseth [b]*
[a] Universidad Politécnica de Valencia, CSIC, Instituto de Tecnología Quimuímica, Ave los Naranjos S-N, E-46022 Valencia, Spain. [b] CoorsTek Membrane Science, Forskningsparken, Gaustadalleen 21, NO-0349 Oslo, Norway.

10:05 I-8_22/O
Intensified Conversion of Natural Gas Using Proton-Conducting Ceramics
Daniel Clark [a], Christian Kjølseth [b], Harald Malerød-Fjeld [b], Selene Hernandez-Morejudo [b], Raquel Zanón [c], Jose M. Serra [c], Dustin Beeaff [b], Camilla Vigen [b], Irene Tirados [b], Per Vestre [b], Reidar Haugsrud [a]*
[a] University of Oslo, Centre for Materials Science and Nanotechnology (SMN), Gaustadalleèn 21, NO-0349 Oslo, Norway. [b] Coorstek Membrane Sciences AS, Gaustadalleèn 21, NO-0349 Oslo, Norway. [c] Instituto de Tecnologia Quimica (UPV-CSIC), Avenida de los Naranjos s/n, 46022 Valencia, Spain.

10:25 I-8_23/O
Modeling Steam Electrolysis and Hydrogen Compression using Mixed Conducting Protonic-Ceramic Membranes
*Benjamin L. Kee, Huayang Zhu, Robert J. Kee **
Colorado School of Mines, Golden, CO 80401, USA

10:45 BREAK

I-8/6

Chairman: Truls Norby

11:00 I-8_24/I
Studies on ionic conductivity in saline hydrides
John T. S Irvine [a], George Carins [a], Maarten C. Verbaeken [a], Martin Owen Jones[a, b]*
[a] University of St Andrews, School of Chemistry, St Andrews, Fife KY16 9ST, UK. [b] STFC, ISIS Facility, ISIS Neutron and Muon Source, Science and Technology Facilities Council, Rutherford Appleton Laboratory, Harwell, Didcot OX11 0QX

11:25 I-8_25/O
Electronic and vibrational properties of substitutional hydride ions in barium titanate
Erik Jedvik Granhed, Anders Lindman, Carin Österberg, Maths Karlsson, Göran Wahnström*
Chalmers University of Technology, Department of Physics, SE-412 96 Gothenburg, Sweden.

11:45 I-8_26/O
Synthesis and NMR analysis of Ba-Ti oxyhydride
Tai Misaki, Itaru Oikawa and Hitoshi Takamura*
Tohoku University, Department of Materials Science, 980-8579, Japan.

12:05 I-8_27/O
Novel proton-conducting nanocomposites for hydrogen separation membranes
Vladislav Sadykov [a, b], Yulia Bespalko [a], Alexey Krasnov [a], Pavel Skryabin [a], Ekaterina Sadovskaya [a, b], Nikita Eremeev [a], Tamara Krieger [a, b], Vladimir Belyaev [a], Zakhar Vinokurov [a, c], Nikolai Uvarov [d, e], Artyom Ulikhin [d]*
[a] Boreskov Institute of Catalysis SB RAS, pr. Akad. Lavrentieva 5, Novosibirsk 630090, Russia. [b] Novosibirsk State University, Pirogova str. 2, Novosibirsk 630090, Russia [c] Budker Institute of Nuclear Physics SB RAS, pr. Akad. Lavrentieva 11, Novosibirsk 630090, Russia. [d] Institute of Solid State Chemistry and Mechanochemistry SB RAS, Kutateladze str. 18, Novosibirsk 630128, Russia. [e] Novosibirsk State Technical University, pr. Karla Marksa 20, Novosibirsk 630073, Russia

12:25 I-8_28/O
Proton Conducting Phosphate Glass Exhibiting High Conductivity at Intermediate Temperatures
*Takuya Yamaguchi [a, b], Junji Nishii [c], Toshiharu Yamashita [d], Hiroshi Kawazoe [d], Tomohiro Ishiyama [e], Takahisa Omata [b]**
[a] Graduate School of Environmental Studies, Tohoku University, Sendai, Japan. [b] IMRAM, Tohoku University, Sendai, Japan. [c] Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan. [d] Kawazoe Frontier Technologies Corporation, Yokohama, Japan. [e] National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan.

12:45 LUNCH

I-8/7

Chairmen: John Irvine, Genki Kobayashi

14:20 I-8_29/I
Relationship between anion arrangement and H^- conductivity in La–Sr–Li oxyhydride system
*Genki Kobayashi**
Research Center of Integrative Molecular Systems, Institute for Molecular Science (IMS), 38 Nishigonaka, Myodaiji, Okazaki, Aichi 444-8585, Japan.

14:45 I-8_30/O
Novel Rare-earth Oxyhydride Conductors: Synthesis, structural analysis, and conductivity measurements
Keiga Fukui [a], Soshi Iimura [a], Wang Junjie [b] Tomofumi Tada [b], Satoru Fujitsu [b], and Hideo Hosono [a, b]
[a] Laboratory for Materials and Structures, Tokyo Institute of Technology, 226-8503, Japan. [b] Research Center for Element Strategy, Tokyo Institute of Technology, 226-8503, Japan

15:05 I-8_31/O
Hydrogen permeability of highly-nonstoichiometric TiN_x thin films based on the hydride ion electron mixed conductivity
Yoshitaka Aoki [a, b], Chiharu Kura [c]*, Chunyu Zhu [a], Hiroki Habazaki [a]*
[a] Faculty of Engineering, Hokkaido University, N13W8 Kita-ku, Sapporo, 060-8628, Japan. [b] JST-PRESTO,4-1-8 Honcho, Kawaguchi, 3320012 Japan. [c] Graduate School of Chemical Science & Engineering, Hokkaido University, N13W8 Kita-ku, Sapporo, 060-8628, Japan.

15:25 I-8_32/O
Influence of Sintering Aids Form on the Electrical Conductivity, Chemical Stability and Sinterability of $BaCe_{0.55}Zr_{0.3}Y_{0.15}O_{3-\delta}$
Jong-Ho Lee [a], Hyegsoon An [a, b], Dong Wook Shin [b], Sung Min Choi [a], Mansoo Park [a], Hyoungchul Kim [a], Kyung Joong Yoon [a], Ji-Won Son [a], Byung-Kook Kim [a], Hae-Weon Lee [a]*
[a]High Temperature Energy Materials Research Center, KIST, Seoul 136-791, Korea. [b]Department of Fuel Cells and Hydrogen Technology, Hanyang University, Seoul 133-791, Korea

15:45 BREAK

I-8/8

Chairmen: José M. Serra / Laura Rioja-Monllor

16:15 I-8_33/I
Experimental study of the mechanical properties of Yttrium-doped barium zirconate electrolyte material
D.Ciria [a], M. Jimenez-Melendo [b], X. Bril [a], N. Roubier [c], V. Aubin [c], Q. Grimal [d], M. Carpenter [c], G. Dezanneau [a]
[a]Laboratoire SPMS, École CentraleSupélec, 92290 Chatenay-Malabry, France. [b]Departamento de Física de la Materia Condensada and Instituto de Ciencia de Materiales, CSIC-Universidad de Sevilla, Ap, Aptdo, 1065, 41080 Sevilla, Spain. [c] Laboratoire MSSMAT, Ecole CentraleSupélec, 92290 Châtenay-Malabry, France. [d]Laboratoire d'Imagerie Biomédicale, UPMC Paris 6 - CNRS UMR 7371 - INSERM U 1146, 15 rue de l'école de médecine, 75006 Paris, France. [e] University of Cambridge, Department of Earth Sciences, *S109 Downing Street* Cambridge CB2 3EQ, UK

16:40 I-8_34/O
Effect of cation ordering on the chemical stability and triple conductivity (h^+, O^{2-} and H^+) in layered double perovskite $LnBaCo_2O_{5+\delta}$ (Ln = La and Y) cathodes
Carlos Bernuy-Lopez [a], Laura Rioja-Monllor [a], Simon L. Jørgensen [a], Takashi Nakamura [b], Sandrine Ricote [c], Ryan O'Hayre [c], Koji Amezawa [b], Mari-Ann Einarsrud [a], Tor Grande[a]*
[a] NTNU Norwegian University of Science and Technology, Trondheim, Norway. [b] Tohoku University, Sendai, Japan. [c] Colorado School of Mines, Golden, CO, United States.

17:00 I-8_35/O
Flash sintering ceramic protonic conductors
R. Muccillo, E. N. S. Muccillo**
Energy and Nuclear Research Institute, Center of Science and Technology of Materials, Travessa R 400, Cidade Universitária, S. Paulo, Brazil 05508-170

17:20 I-8_36/O
Novel Processing of Composite Cathodes for Protonic Ceramic Fuel Cells
Laura Rioja-Monllor [a], Sandrine Ricote [b], Carlos Bernuy-Lopez [a], Marie-Laure Fontaine [c], Tor Grande [a], Ryan O'Hayre [d] and Mari-Ann Einarsrud [a]
[a] Department of Materials Science and Engineering, Norwegian University of Science and Technology, 7491 Trondheim, Norway. [b] Mechanical Engineering Dept. Colorado School of Mines, 1500 Illinois Street, Golden, CO, 80401, USA. [c] SINTEF Materials and Chemistry, 0314 Oslo, Norway. [d] Department of Metallurgical and Materials Engineering, Colorado School of Mines, 1500 Illinois Street, Golden, CO, 80401, USA.

17:40 I-8_37/O
Sulphur tolerance behaviour of $BaCe_{0.65}Zr_{0.20}Y_{0.15}O_{3-\delta}$-$Ce_{0.85}Gd_{0.15}O_{2-\delta}$ ceramic membranes for hydrogen separation
C. Mortalò [a], E. Rebollo [a], S. Escolástico [b], S. De Ambrosis [a], K. Haas-Santo [b], R. Dittmeyer [b], M. Fabrizio [a]*
[a] CNR-ICMATE, Istituto di Chimica della Materia Condensata e di Tecnologie per l'Energia, Corso Stati Uniti 4, 35127 Padova, Italy. [b] IMVT, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany.

I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS

A. Padova Fiere

Room A2

I-9/8: **SOFC Cathodes III - Ruddlesden-Popper-Phases**

Chairman: Rose-Noëlle Vannier

9:00 I-9_36/I
Pr-based efficient oxygen electrodes for Solid Oxide Fuel Cells: from $Pr_2NiO_{4+\delta}$ to $Pr_4Ni_3O_{10\pm\delta}$ and Pr_6O_{11}

Jean-Marc Bassat, Clément Nicollet, Vaibhav Vibhu, Aurélien Flura, Aline Rougier, Jean-Claude Grenier

CNRS, Université de Bordeaux, ICMCB, 87 Av. Dr Schweitzer, Pessac Cedex, F-33608, France

9:25 I-9_37/O
Higher-order Ruddlesden-Popper Phase Materials as Intermediate Temperature-Solid oxide Fuel Cell Cathodes

Mudasir A. Yatoo[a,b], Ainara Aguadero[a], Stephen J. Skinner[a,b]*

[a] Imperial College London, Department of Materials, Prince Consort Road, SW7 2AZ. United Kingdom. [b] Imperial College London/University College London, Prince Consort Road, SW7 2AZ/Gordon Street, WC1E 6B. United Kingdom

9.45 I-9_38/O
$La_2NiO_{4+\delta}$ / $Ce_{0.9}Gd_{0.1}O_{1.95}$ composites as efficient oxygen electrodes for Solid Oxide Fuel Cells application

Clément Nicollet [1], Jean-Marc Bassat [1], Rakesh Sharma[2], Vaibhav Vibhu [1], Aurélien Flura [1], Aline Rougier [1], Jean-Claude Grenier [1], Elisabeth Djurado[2]

[1] CNRS, Université de Bordeaux, ICMCB, 87 Av. Dr Schweitzer, Pessac Cedex, F-33608, France. [2] Université Grenoble Alpes and CNRS, LEPMI, Grenoble, F-38000, France

10:05 I-9_39/O
Role of the doped ceria as interlayer between the electrolyte and the SOFC oxygen electrode: electrochemical studies and interface phenomena

Aurélien Flura, Clément Nicollet, Vaibhav Vibhu, Jean-Marc Bassat, Aline Rougier and Jean-Claude Grenier

CNRS, Université de Bordeaux, ICMCB, 87 Avenue du Dr. Schweitzer, F-33608 Pessac Cedex, France

10:25 I-9_40/O
Performance of $La_{0.5}Sr_{1.5}MnO_{4\pm\delta}$ as electrode material for symmetrical Solid Oxide Fuel Cell

*Mónica V. Sandoval[a,b], Carolina Cardenas[a,b], Caroline Pirovano[b], Edouard Capoen[b], Pascal Roussel[b] and Gilles H. Gauthier[a]**

[a] Universidad Industrial de Santander, INTERFASE, Bucaramanga, Colombia. [b] Univ. Lille, CNRS, Centrale Lille, ENSCL, Univ. Artois, UMR 8181 - UCCS - Unité de Catalyse et Chimie du Solide, F-59000 Lille, France.

10:45 BREAK

I-9/9: **SOFC Cathodes IV - Stability Issues**

Chairman: Stephen Skinner

11:00 I-9_41/I
Cr/Si-poisoning of $La_2NiO_{4+\delta}$ used as air electrode in SOFC and SOEC applications

Andreas Egger[a], Nina Schrödl[a], Werner Sitte[a], Christian Gspan[b], Ferdinand Hofer[b]*

[a] Montanuniversitaet Leoben, Chair of Physical Chemistry, Franz-Josef-Strasse 18, Leoben, Austria. [b] Institute for Electron Microscopy and Nanoanalysis (FELMI), Graz University of Technology & Graz Centre for Electron Microscopy (ZFE), Austria

11:25 I-9_42/O
Evaluation of Surface Oxygen Exchange Coefficient of $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ after Chromium Poisoning

Riyan Achmad Budiman[a], Jeffrey De Vero[a], Tomohiro Ishiyama[a], Katherine Develos-Bagarinao[a], Haruo Kishimoto[a], Katsuhiko Yamaji[a], Teruhisa Horita[a], Harumi Yokokawa[b]*

[a]National Institute of Advanced Industrial Science and Technology, Higashi, 1-1-1, AIST Tsukuba Central 5, Tsukuba, Ibaraki 305-8565, Japan. [b]Institute of Industrial Science, The University of Tokyo, Komaba 4-6-1, Meguro-Ku, Tokyo, 153-8505, Japan

11:45 I-9_43/O
Nanoscale Behaviour of Temperature and Polarization Dependent Cr Poisoning of $(La_{0.6}Sr_{0.4})(Co_{0.2}Fe_{0.8})O_3$ Solid Oxide Fuel Cell Cathodes

Na Ni[a], Cheng Cheng Wang [b], San Ping Jiang[b], Stephen Skinner[a]*

[a] Department of Materials, Imperial College London, Exhibition road, SW7 2AZ London UK. [b] Fuels and Energy Technology Institute & Department of Chemical Engineering, Curtin University, Perth, WA 6102, Australia

12.05 I-9_44/O
Insight into the reaction mechanism of $(La_{0.58}Sr_{0.40})(Co_{0.20}Fe_{0.80})O_{3-\delta}$ cathode with volatile chromium – from theory to stack

Alexander Beez [a, b], Xiaoyan Yin [b], Nikolas Grünwald [b], Norbert H. Menzler [b], Martin Bram [a, b]*

[a] Christian Doppler Laboratory for Interfaces in Metal-Supported Energy Converters, 52425 Jülich, Germany. [b] Forschungszentrum Jülich, Institute of Energy and Climate Research, 52425 Jülich, Germany

12:25 I-9_45/O
Oxygen exchange kinetics and long-term stability of $La_{0.8}Ca_{0.2}FeO_{3-\delta}$ in sulphur dioxide-containing atmospheres

Edith Bucher [a]., Christian Berger [a], Christian Gspan [b], Alexander Menzel [c], Werner Sitte [a]*

[a] Montanuniversitaet Leoben, Chair of Physical Chemistry, Franz-Josef-Straße 18, Leoben, Austria. [b] Institute for Electron Microscopy and Nanoanalysis (FELMI), Graz University of Technology & Graz Center for Electron Microscopy (ZFE), Austrian Cooperative Research (ACR), Steyrergasse 17, Graz, Austria. [c] University of Innsbruck, Institute of Physical Chemistry, Innrain 80-82, Innsbruck, Austria

12:45 LUNCH

I-9/10: Characterization II

Chairman: John Kilner

14:10 I-9_46/I
Ion dynamics in functional materials studied using high-temperature solid-state NMR

Matthew T. Dunstan[a], John M. Griffin[b], David M. Halat[a], Hannah Laeverenz Schlogelhofer[a], Michael W. Gaultois[a], Ivana Radosavljevic Evans[c], Clare P. Grey[a]*

[a] University of Cambridge, Department of Chemistry, Lensfield Road, Cambridge CB2 1EW, United Kingdom. [b] Lancaster University, Department of Chemistry, Lancaster LA1 4YB, United Kingdom. [c] Durham University, Department of Chemistry, Science Site, Durham DH1 3LE, United Kingdom.

14:35 I-9_47/I
Effective surface exchange coefficient for three-phase boundary of dual-phase composite

Changrong Xia[a,], Bobing Hu [a], Yunlong Wang [a], Minghao Zheng [a], Henny J. M. Bouwmeester [a,b]*

[a] Department of Materials Science and Engineering, University of Science & Technology of China, No. 96 Jinzhai Road, Hefei, Anhui Province, 230026, P. R. China. [b] Department of Science & Technology, MESA+ Institute for Nanotechnology, University of Twente, P.O. Box 217, 7500 AE Enschede, The Netherlands.

15:00 I-9_48/O
Cation tracer diffusion in $A^{2+}B^{4+}O_3$ perovskites

Rokas Sažinas[a], Isao Sakaguchi[b] and Tor Grande[a]*

[a] NTNU Norwegian University of Science and Technology, Department of Materials Science and Engineering, NO-7491, Norway. [b] National Institute for Materials Science, Ion Beam Application Laboratory, 305-0044, Japan

15:20 I-9_49/O
High-throughput fabrication and electrochemical characterization of SOFC cathode materials

Aitor Hornés, Aruppukottai Bhupathi Saranya, Alejandro Morata, Albert Tarancón*

Catalonia Institute for Energy Research (IREC), Department of Materials for Energy, Jardins de les Dones de Negre 1, 08930-Sant Adrià de Besòs (Barcelona), Spain

15:40 I-9_50/O
Kinetic Aspects of the Synthesis of $Ln_{6-\delta}MoO_{12-\delta}$ (Ln= Ho-Yb; x=0, 0.5) Using Mechanical Activation of Oxides

A.V. Shlyakhtina[a]*, I.V. Kolbanev[a], Å.N. Degtyarev[a], Î.Ê. Karyagina[b], L.G. Shcherbakova[a]

[a] Semenov Institute of Chemical Physics, Russian Academy of Sciences, ul. Kosygina 4, Moscow, 119991 Russia. [b] Emanuel Institute of Biochemical Physics, Russian Academy of Sciences, ul. Kosygina 4, Moscow, 119991 Russia

16:00 BREAK

I-9/11: **Electrolytes I**

Chairman: Tatsumi Ishihara

16:15 I-9_51/I
Self-Healing and -Assembling Ceramic Electrolytes and Membranes

Truls Norby[a], Ragnhild Hancke[a], Marie-Laure Fontaine[b], Tor Grande [c]*

[a] Univ. of Oslo, Dept. Chemistry, SMN, FERMiO, Gaustadalléen 21, NO-0349 Oslo, Norway. [b] SINTEF Materials and Chemistry, POB 124 Blindern, NO-0314 Oslo, Norway. [c] NTNU Norwegian Univ. Sci. Techn., Dept. Mater. Sci. Engin., NO-7491 Trondheim, Norway

16:40 I-9_52/O
Evaluation of Isotope Diffusion Coefficient and Surface Exchange Coefficient of Sc_2O_3 doped ZrO_2 by $^{18}O_2$ Exchange Method

Takaaki Sakai[a],[b],[c], Junji Hyodo[d]*, Masako Ogushi[b], Atsushi Inoishi[e], Shintaro Ida[b],[c],[f], Tatsumi Ishihara[b],[c],[f]*

[a]CMS, Kyushu University, 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan. [b]Department of Applied Chemistry, Faculty of Engineering, Kyushu University, 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan. [c]Next-FC, Kyushu University, 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan. [d]Inorganic Material Research Division, INAMORI Frontier Research Center, Kyushu University, 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan. [e]Research and Education Center for Advanced Energy Materials, Devices, and Systems, Kyushu University, 6-1 Kasuga-kouen, Kasuga 816-8580, Japan. [f]WPI-I2CNER, Kyushu University, 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan

17:00 I-9_53/O
Improvement of Ionic Conductivity in A-site Lithium Doped Sodium Bismuth Titanate

Duke (Po-Chen) Shih, Ainara Aguadero, Stephen J. Skinner*

Department of Materials, Imperial College London, Prince Consort Road, London SW7 2BP, UK

17:20 I-9_54/O
Effects of alumina incorporation by particle atomic layer deposition on sintering, microstructure, and ionic conductivity of yttria-stabilized zirconia (8YSZ)

Christopher J. Bartel[a], Rebecca J. O'Toole[a], Maila U. Kodas[a], Sandrine Ricote[b], Neal P. Sullivan[b], Austin W. Drake[a], Alexa J. Horrell[a], Robert A. Hall[c], Charles B. Musgrave[a], Alan W. Weimer[a]

[a] University of Colorado Boulder, Department of Chemical & Biological Engineering, 3415 Colorado Ave. Boulder, CO 80309, USA. [b] Colorado School of Mines, Department of Mechanical Engineering, Colorado Fuel Cell Center, 1500 Illinois Street, Golden, Colorado 80401, USA. [c] ALD NanoSolutions, Inc. 580 Burbank Street, Unit 100, Broomfield, CO 80020, USA

17:40 I-9_55/O
Impact of Chromium on Conductivity of Electrolytes with Fluorite and Perovskite Structures in Solid Oxide and Ceramic Proton Conducting Fuel Cells

*Xiaomei Zhang, Elena Yu. Konysheva **

Xi'an Jiaotong-Liverpool University, Department of Chemistry, 111 Ren'ai Road, Suzhou, 215123 China

18:00 I-9_56/O
The effect of synthesis and thermal treatment on phase composition and ionic conductivity of Na-doped $SrSiO_3$

*Raghvendra Pandey[a], Sabrina Presto[b], Maria Paola Carpanese[c,b], Antonio Barbucci[c,b], Rodolfo Botter[c], Prabhakar Singh[d] Massimo Viviani[b]**

[a] Department of Physics, A.R.S.D. College, University of Delhi, New Delhi-110021, India. [b] Institute of Condensed Matter Chemistry and Energy Technologies, CNR, P.le Kennedy 1 − Pad. D, 16129 Genova, Italy. [c] Department of Chemical, Civil and Environmental Engineering, UNIGE, P.le Kennedy 1 − Pad. D, 16129 Genova, Italy. [d] Department of Physics, Indian Institute of Technology (Banaras Hindu University), Varanasi 221 005, India

I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS

B. Fiore di Botta

Room B6

I-10/5

Chairman: Johan Ten Elshof

9:00 I-10_18/I
Template-Realized Functional Nanostructures for Energy Conversion and Storage Devices

Yong Lei

Institute of Physics, Technical University of Ilmenau, Germany

9:25 I-10_19/O
Metal oxides nano-engineering for carbon fibers based electrodes in ultra-high charge-discharge supercapacitors

Hemesh Avireddy [a,b], Cristina Flox [a], PengYi Tang [a,c] Jordi Arbiol [c,d], Joan Ramon Morante [a, b,]*

[a] IREC, Catalonian Institute for Energy Research. Jardins de les Dones de Negre 1, 08930. Sant Adrià de Besòs, Spain. [b] Faculty of Physics, University of Barcelona, Barcelona, Spain. [c] Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC, and The Barcelona Institute of Science and Technology (BIST), Campus UAB, Bellaterra, 08193 Barcelona, Catalonia, Spain. [d] ICREA, Passeig Lluís Companys 23, 08010 Barcelona, Catalonia, Spain.

9:45 I-10_20/O
Continuous Hydrothermal Flow Synthesis of Oxide Nanomaterials in Supercritical H_2O: $CoFe_2O_4$ and Its OER Catalytic Activity

Yu Xu, Philipp Zielke, Ragnar Kiebach*

Department of Energy Conversion and Storage, Technical University of Denmark (DTU Risø), Frederiksborgvej 399, 4000 Roskilde, Denmark

10:05 I-10_21/O
***In-situ* preparation of $Ca_{0.5}Mn_{0.5}O$/C as a novel high-activity catalyst for oxygen reduction reaction**

*Yuqi Lyu [a], Francesco Ciucci [a, b]**

[a] Hong Kong University of Science and Technology, Department of mechanical engineering, Hong Kong, SAR China. [b] Hong Kong University of Science and Technology, Department of Chemical and Biomolecular Engineering, Hong Kong, SAR China.

10:25 I-10_22/O
NiO nanoflakes on H-plasma nanosculptured carbon fiber patches: flexible electrodes with outstanding capacitive performances

Rocco Carcione[a,b], Mariglen Angjellari[a,b], Emanuela Tamburri[a,b], Maria Letizia Terranova[a,b]*

[a] Università degli Studi di Roma "Tor Vergata", Dip.to di Scienze e Tecnologie, Rome, Italy. [b]Nanoshare s.r.l. – Via G. Peroni 386, 00131 Rome, Italy

10:45 BREAK

I-10/6

Chairman: Leonhard Mayrhofer

11:00 I-10_23/I
Photo-Induced Catalytic Processes at Nanostructured Metal Oxides for Energy Harvesting and Environmental Applications

Renata Solarska

University of Warsaw, Centre of New Technology, Banacha 2c, 02-089 Warsaw, Poland

11:25 I-10_24/O
RuO_2 films for Si-based water splitting photoanodes

Karol Fröhlich[a], Miroslav Mikolášek[b], Kristína Hušeková[a], E. Dobročka[a], Vlastimil Řeháček[b], Ladislav Harmatha[b]*

[a] Institute of Electrical Engineering SAS, Dúbravská cesta 9, 841 04, Bratislava, Slovakia. [b] Faculty of Electrical Engineering and Information Technology, STU in Bratislava, Ilkovičova 3, 812 19 Bratislava, Slovakia

11:45 I-10_25/O
Chalcogenide based photocathodes for solar energy storage devices

Teresa Andreu [a],[b], Carles Ros[a], Sergio Giraldo[a], Yudania Sánchez[a], Edgardo Saucedo[a], Alejandro Pérez[a],[b] and Juan Ramon Morante[a],[b]*

[a] Catalonia Institute for Energy Research (IREC), Jardins de les Dones de Negre 1, 08930, Sant Adrià de Besós, Spain. [b] University of Barcelona, C/Marti i Franqués, 1, Barcelona, 08028, Spain

12:05 I-10_26/O
Enhancement of the Photo-Electrochemical Performance of ZnO Nanorod Arrays

J. Kegel,[a] J. Halpin,[a] F. Laffir,[b] M.E. Pemble,[a,c] I.M. Povey [a]

[a] Tyndall National Institute, University College Cork, Lee Maltings, Cork, Ireland. [b] Bernal Institute, University of Limerick, Limerick, Ireland. [c] Department of Chemistry, University College Cork, Cork, Ireland.

12:25 LUNCH

I-10/7

Chairman: Colm O'Dwyer

14:20 I-10_27/I
Mechanism Based Design and Synthesis of Tungsten Oxo Alkoxide Precursors for the Deposition of WO_x Films and Nanostructures

Lisa McElwee-White, Duane C. Bock, Xiaoming Su and Nathan C. Ou*

University of Florida, Department of Chemistry, P.O. Box 117200, Gainesville, FL USA

14:45 I-10_28/O
Fabrication of nanostructured perovskite oxides with remarkable catalytic activity using radical complexing ligands

*Jonas Scholz[a], Bugra Kayaalp[a,d], Antonella Glisenti[b,c], Marta Maria Natile[c], Siwon Lee[d], WooChul Jung[d] and Simone Mascotto[a]**

[a] Institute of Inorganic and Applied Chemistry, University of Hamburg, Martin-Luther-King-Platz 6, 20146 Hamburg, Germany. [b] Department of Chemical Science, University of Padova, via Francesco Marzolo 1, 35131 Padova, Italy. [c] CNR-ICMATE INSTM, via Francesco Marzolo 1, 35131 Padova, Italy. [d] Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, 291, Daehak-ro, Yuseong-gu, 34141 Daejeon, Republic of Korea

15:05 I-10_29/O
Structural and transport properties of doped bismuth titanates

Vladislav Sadykov[a,b], Maria Koroleva[c], Irina Piir[c], Pavel Skriabin[a], Aleksey Krasnov[a], Aleksey Krasnov[c], Ekaterina Sadovskaya[a,b], Nikita Eremeev[a] *

[a] Boreskov Institute of Catalysis SB RAS, pr. Akad. Lavrentieva 5, Novosibirsk 630090, Russia. [b] Novosivirsk State University, Pirogova str. 2, Novosibirsk 630090, Russia. [c] Institute of Chemistry Komi SC UB RAS, Pervomayskaya St. 48, Syktyvkar, 167982, Russia

15:25 I-10_30/O
Voltage control of optical properties of gadolinium oxide via solid-state ionic transport

*Mantao Huang, Aik Jun Tan, Geoffrey Beach**

Massachusetts Institute of Technology, Department of Materials Science and Engineering, 77 Massachusetts Ave. Cambridge MA 02139, USA.

15:45 BREAK

I-10/8

Chairman: Teresa Andreu

16:15 I-10_31/O
Stabilization of superionic δ–Bi_2O_3 phase at room temperature by thermal nanocrystallization of bismuth oxide glasses

*Tomasz K. Pietrzak, Marek Wasiucionek, Jerzy E. Garbarczyk**

Faculty of Physics, Warsaw University of Technology, Koszykowa 75, PL-00-662 Warsaw, Poland

16:35 I-10_32/O
Mesostructured Fe_2O_3@ MCM41 sorbents for mid-temperature H_2S removal

C. Cara[a,b,c], A. Musinu[a,b], A. Ardu[a,b,c], M. Sanna[a,b], V. Mameli[a,b], E. Rombi[a], C. Cannas[a,b,c]*

[a] Dipartimento di Scienze Chimiche e Geologiche, Università di Cagliari, s.s. 554 bivio per Sestu, Monserrato, CA, Italy. [b] INSTM, Cagliari Unit, Italy. [c] Consorzio AUSI, CREATE, Palazzo Bellavista Monteponi, Iglesias, CI, Italy.

16:55 I-10_33/O
Syngas production by CO_2 electrochemical reduction using low Ag loading on Titania nanotubes

M. Amin Farkhondehfal [a],Simelys Hernàndez[a]* ,Andrea Lamberti[a],Matteo Rattalino [a],Michiel Makkee[b] ,Nunzio Russo[a],Guido Saracco[c]*

[a] Politecnico di Torino, Department of Applied Science and Technology (DISAT) C.so Duca degli Abruzzi, 24, 10129, Torino, Italy. [b] TU Delft, Department of Chemical Engineering, Julianalaan 136, 2628 BL Delft, The Netherlands. [c] Center for Sustainable Future Technologies (CSFT@POLITO), Istituto Italiano di Tecnologia, Corso Trento 21, 10129 Torino Italy

17:15 I-10_34/O
Mesoporous Ni-CeO_2-Al_2O_3 catalyst for plasma-catalysis CO_2 methanation

Martí Biset[a], Jordi Guilera [a], Andrea Ceballos [b], Joan Ramon Morante [a] [b], Teresa Andreu [a] [b]*

[a] Catalonia Institute for Energy Research (IREC), Jardins de les Dones de Negre 1, 08930, Sant Adrià de Besós, Spain. [b] University of Barcelona, C/Marti i Franqués, 1, Barcelona, 08028, Spain

17:35 I-10_35/O
Layered zirconium phosphates/phosphonates and layered double hydroxides: suitable solid supports for active systems in heterogeneous catalysis

Monica Pica[a], Morena Nocchetti[a], Riccardo Vivani[a], Anna Donnadio[a], Oriana Piermatti[b], Luigi Vaccaro[b], Mario Casciola[b].*

[a] University of Perugia, Department of Pharmaceutical Sciences, Via del Liceo,1 06123 Perugia (Italy). [b] University of Perugia, Department of Chemistry, Biology and Biotechnologies, Via Elce di Sotto, 8 06123 Perugia (Italy)

I-11 – FUNCTIONAL METAL OXIDE INTERFACES IN EFFICIENT ELECTROCHEMICAL ENERGY CONVERSION, BIOMASS CONVERSION AND CHARGE STORAGE SYSTEMS

B. Fiore di Botta

Room B4

I-11/1

Chairmen: Pawel Kulesza, R. John Errington, Nicolas Alonso-Vante

16:15 I-11_1/I
Design concepts for metal oxide based photoelectrodes employed in solar fuel generation

*Gergely F. Samu [a, b], Egon Kecsenovity [a, b], Csaba Janáky [a, b]**

[a] University of Szeged, Department of Physical Chemistry and Materials Science, 6720 Szeged, Aradi sq. 1, Hungary. [b]Hungarian Academy of Sciences, MTA-SZTE „Momentum" Photoelectrochemistry Research Group, 6720 Szeged, Aradi sq. 1, Hungary

16:40 I-11_2/I
The Influence of Yttrium and Cerium on the Opto-electronic Properties of Anatase as Photocatalyst and Electrocatalytic Center Supports

*Luis Alberto Estudillo-Wong [a], Guadalupe Ramos-Sánchez [b], Nicolás Alonso-Vante [a]**

[a] IC2MP, UMR-CNRS 7285, University of Poitiers, 4 rue Michel Brunet, 86022 Poitiers, France. [b] Universidad Autónoma Metropolitana – Iztapalapa, San Rafael Atlixco 108, Iztapalapa, Vicentina, 09340, CDMX, México.

17:05 I-11_3/I
Electrocatalytic activity of mixed complex metal oxide catalysts for electrochemical medium-temperature devices

Enn Lust, Gunnar Nurk, Indrek Kivi, Priit Möller, Kadi Lillmaa, Rait Kanarbik, Martin Maide, Ove Korjus, Laur K. Salvan, Freddy Kukk*

Institute of Chemistry, University of Tartu, Ravila 14a, Tartu, 50411, Estonia

17:30 I-11_4/I
Hydrogen Evolution and Water Oxidation Catalyzed by Polyoxometalate Complexes of Metal-Oxide Nanocrystals

Ira A. Weinstock

Ben-Gurion University of the Negev and the Ilse Katz Institute for Nanoscale Science and Technology, Beer Sheva, 84105, Israel

17:55 I-11_5/O
Hybrid Metal Oxide Based Interfaces for Photoelectrochemical and Electrocatalytic Reduction of Carbon Dioxide

Pawel J. Kulesza

Faculty of Chemistry, University of Warsaw, Pasteura 1, PL-02-093 Warsaw, Poland.

I-12 – DEFECT CHEMISTRY, TRANSPORT AND REACTIVITY AT GAS/ELECTRODE INTERFACES

B. Fiore di Botta

Room B10

I-12/5

Chairman: Koichi Eguchi

09:00 I-12_19/I
Investigation of Carbon Inhibition and Oxygen Exchange on Model Solid Oxide Fuel Cell Anode Catalysts with Atomic Resolution *In Situ* Imaging and Spectroscopy

*E. L. Lawrence and P. A. Crozier**

Arizona State University, School for Engineering of Matter, Transport and Energy, Tempe, Arizona 85287, USA

9:25 I-12_20/O
Reaction Pathways in Ni /Yttria Stabilized Zirconia Anodes

*M. C. Doppler [a, b], J. Fleig [a], A. K. Opitz [a, b]**

[a] Institute of Chemical Technologies and Analytics, TU Wien, Getreidemarkt 9-164/EC, 1060 Vienna, Austria. [b] Christian Doppler Laboratory for Interfaces in Metal-Supported Electrochemical Energy Converters, Getreidemarkt 9/164-EC, 1060 Vienna, Austria

9.45 I-12_21/O
Remarkable chemical reactivity of highly porous $La_xSr_{1-x}Fe_yTi_{1-y}O_3$ as potential mixed conducting anode for SOFCs

*Bugra Kayaalp [a, b], Siwon Lee [b], WooChul Jung [b], Simone Mascotto [a]**

[a] Institute of Inorganic and Applied Chemistry, University of Hamburg, Martin-Luther-King-Platz 6, 20146 Hamburg, Germany. [b] Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), 291, Daehak-ro, Yuseong-gu, 34141 Daejeon, Republic of Korea

10:05 I-12_22/O
Oxygen transport paths in screen-printed dense Pt electrodes on YSZ

Yingjing Zheng [a, b], Ulrich Sauter [a], Ralf Moos [b]*

[a] Robert Bosch GmbH, Corporate Research, Renningen, 70465 Stuttgart, Germany. [b] University of Bayreuth, Department of Functional Materials, 95440 Bayreuth, Germany

10:25 I-12_23/O
Contribution of Electrochemical Reaction through Triple Phase Boundaries in a Mixed Ionic and Electronic Conducting SOFC Cathode

Keita Mizuno [a], Yoshinobu Fujimaki [a], Yuta Kimura [b], Takashi Nakamura [b], Kiyofumi Nitta [c], Yasuko Terada [c], Keiji Yashiro [d], Tatsuya Kawada [d], Fumitada Iguchi [a], Hiroo Yugami [a], Koji Amezawa [b]*

[a] Graduate School of Engineering, Tohoku University, 6-6-01 Aoba, Aramaki, Aoba-ku, Sendai, 980-8579, Japan. [b] IMRAM, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai, 980-8577, Japan. [c] JASRI, 1-1-1 Koto, Sayo-cho, Sayo-gun, Hyogo, 679-5798, Japan. [d] Graduate School of Environmental Studies, Tohoku University, 6-6-01 Aoba, Aramaki, Aoba-ku, Sendai, 980-8579, Japan

10:45 BREAK

I-12/6

Chairman: Peter Crozier

11:00 I-12_24/I
Degradation Factors in (La,Sr)(Co,Fe)$O_{3-\delta}$ Cathode/Doped-CeO_2 Interlayer/Y_2O_3–ZrO_2 Electrolyte System for Solid Oxide Fuel Cells

Koichi Eguchi [a], Siqi Li [a], Kyosuke Kishida [b], Haruyuki Inui [b], Hiroki Muroyama [a], and Toshiaki Matsui [a]*

a) Kyoto University, Department of Energy and Hydrocarbon Chemistry, Graduate School of Engineering, Nishikyo-ku, Kyoto 615-8510, Japan. b) Kyoto University, Department of Material Science and Engineering, Graduate School of Engineering, Yoshida Honmachi, Sakyo-ku, Kyoto 606-8501, Japan

11:25 I-12_25/O
Effects of electrochemical potential and crystal orientation on aliovalent dopant segregation on perovskite oxides

Dongha Kim, Fatih Piskin, Roland Bliem, Bilge Yildiz*

Massachusetts Institute of Technology, Department of Materials Science and Engineering and Department of Nuclear Science and Engineering, 77 Massachusetts Av., 02139 Cambridge, USA

11:45 I-12_26/O
Oxygen-Deficient Ruddlesden-Popper $Pr_{1-x}Sr_{1+x}NiO_{4-\delta}$ as Prospective Oxygen Electrode Materials for SOFC/SOEC

Aleksey Yaremchenko [a], Ekaterina Kravchenko [a, b], Kiryl Zakharchuk [a], Jekabs Grins [c], Gunnar Svensson [c], Vladimir Pankov [b]*

[a] CICECO – Aveiro Institute of Materials, Department of Materials and Ceramic Engineering, University of Aveiro, 3810-193 Aveiro, Portugal. [b] Department of Chemistry, Belarusian State University, Leningradskaya 14, 220006 Minsk, Belarus. [c] Department of Materials and Environmental Chemistry, Stockholm University, SE-106, 91 Stockholm, Sweden

12:05 I-12_27/O
***In Situ* Investigation of Strain Effects on the Redox Behaviour of Thin Film $La_{0.5}Sr_{0.5}Mn_{0.5}Co_{0.5}O_{3-\delta}$**

Celeste van den Bosch [a], Andrea Cavallaro [a], José Santiso [b], Giannantonio Cibin [c], Stephen Skinner [a], Ainara Aguadero [a]*

[a] Department of Materials, Imperial College London, London, UK. [b] Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and The Barcelona Institute of Science and Technology, Campus UAB, Bellaterra, 08193 Barcelona, Spain. [c] Diamond Light Source, Harwell Science and Innovation Campus, Diamond House, Didcot, Oxfordshire OX11 0DE, United Kingdom

12:25 LUNCH

I-12/7

Chairman: Dane Morgan

14:20 I-12_28/O
Enhanced electrochemical activity of $(Pr,Ce)O_{2-\delta}$-based composite cathode for thin-film-based low-temperature solid oxide fuel cells

*Han Gil Seo, WooChul Jung**

Korea Advanced Institute of Science and Technology, Materials Science and Engineering, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea

14:40 I-12_29/O
$La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ - $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$ composite cathode for intermediate-temperature solid oxide fuel cells

M. Paola Carpanese [a, b], Davide Clematis [a], Sabrina Presto [b], Massimo Viviani [b], Antonio Barbucci [a, b]*

[a] UNIGE-DICCA – Piazzale J. F. Kennedy 1, 16129 Genova, Italy. [b] CNR-ICMATE, P.le J. F. Kennedy 1 − Pad. D, 16129 Genova, Italy

15:00 I-12_30/O
Enhancement of oxide ionic transport through multilayered nanostructured cathodes

Katherine Develos-Bagarinao [a], Haruo Kishimoto [a], Jeffrey de Vero [a], Tomohiro Ishiyama [a], Katsuhiko Yamaji [a], Teruhisa Horita [a], Harumi Yokokawa [a, b]*

[a] National Institute of Advanced Industrial Science and Technology, Research Institute for Energy Conservation, AIST Tsukuba Central 5, 1-1-1 Higashi, Tsukuba, Ibaraki 305-8565, Japan. [b] Institute of Industrial Science, The University of Tokyo, Komaba 4-6-1, Meguro-Ku, Tokyo, 153-8505, Japan

15:20 I-12_31/O
Surface oxygen adsorption on SOFC cathode evaluated by TPD

Emi Takahashi[a], Keiji Yashiro[a],Hiromi Sugiyama[b], Jun Kubota[b], Shin-ichi Hashimoto[a],Tatsuya Kawada[a]*

[a] Graduate School of Environmental Studies, Tohoku University, 6-6-01 Aramaki Aoba, Sendai 980-8579, Japan. [b] School of Engineering, Fukuoka University, 8-19-1 Nanakuma, Fukuoka 814-0180, Japan

15:40 BREAK

I-12/8

Chairman: Jong Hoon Joo

16:15 I-12_32/O
Mechanisms of Oxygen Exchange at (La,Sr)CoO_3 Interfaces

Dane Morgan [a], Yipeng Cao [a], Milind J. Gadre [a], Anh T. Ngo [b], Stuart B. Adler [c]

[a] University of Wisconsin-Madison, Department of Materials Science and Engineering, 1509 University Avenue, Madison, WI 53706, United States. [b] Argonne National Lab, Material Science Division, 9700 S. Cass Avenue, Argonne, IL 60439, United States. [c] Department of Chemical Engineering, University of Washington, Seattle, WA 98195, United States

16:35 I-12_33/O
The versatility of $Sr_2Fe_{1.5}Mo_{0.5}O_{6-\delta}$ (SFMO) as electrode in oxide and proton conducting solid-oxide fuel cells: a quantum mechanical study of ion diffusion and chemical reactivity

Ana B. Muñoz-García, Michele Pavone*

University of Naples Federico II, Department of Chemical Sciences, Comp. Univ. Monte Sant'Angelo, Via Cintia 26, 80126, Napoli, Italy

16:55 I-12_34/O
Oxygen reduction reaction mechanism on $(La_{0.6}Sr_{0.4})FeO_{3-\delta}$ thin film electrode

*Zixuan Guan [a]+, David Mueller[b], Chirranjeevi Balaji Gopal [b], Michael Machala [b], Hendrik Bluhm [c] and William Chueh [b]**

[a]Applied Physics, Stanford University, 94305, USA. [b]Materials Science & Engineering, Stanford University, 94305, USA. [c]Advanced Light Source, Lawrence Berkeley National Laboratory, 94720, USA

17:15 I-12_35/O
A Comparative Study of Polarization at Perovskite Type Oxide Cathodes for Solid Oxide Fuel Cells

Tatsuya Kawada

Graduate School of Environmental Studies, Tohoku University, 6-6-01 Aoba, Aramaki, Aoba-ku, Sendai 980-8579, Japan

I-13 – ELECTRO-CHEMO-MECHANICAL COUPLING IN ENERGY STORAGE AND CONVERSION MATERIALS

A. Padova Fiere

Room A5

I-13/1: **Strain & Transport**

Chairman: Nicola Perry

09:00 I-13_1/I
Strain Engineering of Oxide Thin Films for Oxide Ionotronics

Ho Nyung Lee

Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, United States

9:25 I-13_2/I
Considering elastic strain effects in rechargeable battery electrochemistry

Tetsu Ichitsubo, Hidemi Kato*

Institute for Materials Research, Tohoku University 980-8577, Japan

9:50 I-13_3/O
Strain Effecs on Oxygen Point Defect Formation and Migration in Perovskite and Ruddlesden-Popper Phases

Dane Morgan [a], Tam Mayeshiba [a], Shenzhen Xu [a], Ryan Jacobs [a], Wei Xie [b], Yueh-Lin Lee [c], Yang Shao-Horn [d]

[a] University of Wisconsin-Madison, Department of Materials Science and Engineering, 1509 University Avenue, Madison, WI 53706, United States. [b] University of California - Berkelely, Department of Materials Science and Engineering, 216 Hearst Mining Bldg, Berkeley, CA 94704, United States. [c] U.S. Department of Energy, National Energy Technology Laboratory, Pittsburgh, PA 15236, United States. [d] Electrochemical Energy Laboratory, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139, United States

10:10 I-13_4/O
Oxygen Non-Stoichiometry and Ionic Conductivity of $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ under Uniaxial Compression

Wakako Araki [a, b], MiaoLong Qiu [a], Yoshio Arai [a]*

[a] Saitama University, Department of Mechanical Engineering, 255 Shimo-Okubo, Sakura-ku, Saitama 338 8570, Japan. [b] Department of Materials, Imperial College London, Exhibition Road, London SW7 4AZ, United Kingdom

10:30 BREAK

I-13/2: **Stress & Defect Chemistry**

Chairman: Koji Amezawa

11:00 I-13_5/O
Non-classical electrostriction in ion conductors: structure and properties

Nimrod Yavo [a], Ori Yeheskel [c], Ellen Wachtel [a], Anatoly Frenkel [b] and Igor Lubomirsky [a]

[a] Dept. of Materials and Interfaces, Weizmann Institute of Science, Rehovot, Israel. [b] Dept. of Materials Science and Chemical Engineering, Stony Brook University, NY. [c] Nuclear Research Center—Negev, Beer Sheva 84190, Israel

11:20 I-13_6/O
Defect Chemistry of Zirconates under High Pressure

Hitoshi Takamura*, Kazutoshi Nakajima, Hiroaki Kawamori, Itaru Oikawa

Department of Materials Science, Graduate School of Engineering, Tohoku University, Aramaki Aoba, Sendai 980-8579, Japan

11:40 I-13_7/O
Quantitative Evaluation of the Relationship between Mechanical Stress and Li Chemical Potential in $LiCoO_2$

Yuta Kimura [a], Keita Funayama [b], Mahunnop Fakkao [b], Takashi Nakamura [a], Naoaki Kuwata [a], Tatsuya Kawada [c], Junichi Kawamura [a], Koji Amezawa [a]

[a] Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai 980-8577, Japan. [b] Graduate School of Engineering, Tohoku Univerisity, 6-6-01 Aramaki-Aoba, Aoba-ku, Sendai, 980-8579, Japan. [c] Graduate School of Environmental Studies, Tohoku Univerisity, 6-6-01 Aramaki-Aoba, Aoba-ku, Sendai, 980-8579, Japan

12:00 I-13_8/O
Impact of dislocations on surface reactivity in doped ceria

*Lixin Sun [a], Bilge Yildiz [a, b]**

[a] Massachusetts Institute of Technology, Department of Nuclear Science and Engineering, 77 Masschusetts Avenue, Cambridge, MA, 02139, USA. [b] Massachusetts Institute of Technology, Department of Material Science and Engineering, 77 Masschusetts Avenue, Cambridge, MA, 02139, USA

12:20 I-13_9/O
Tunable Oxygen Diffusion and Electronic Conduction in $SrTiO_3$ by Dislocation-induced Space Charge Fields

*Kiran K. Adepalli [a, b], Jing Yang [a], Joachim Maier [c], Harry L. Tuller [a] and Bilge Yildiz [a, b]**

[a] Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139, USA. [b] Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139, USA. [c] Max Planck Institute for Solid State Research, Heisenbergstrasse 1, Stuttgart 70569, Germany.

12:40 LUNCH

I-13/3: **Materials Chemistry by Design**

Chairman: Eric Wachsmann

14:20 I-13_10/I
Understanding the Role of Soft Phonons in the Ionic Transport Properties of Complex Oxides: The $Ln_2NiO_{4+\delta}$ Family

Nicole A. Benedek [a] Brian M. Abbett [b], and Xinyu Li [c]*

[a] Department of Materials Science and Engineering, Cornell University, Ithaca, New York 14853 USA. [b] School of Applied and Engineering Physics, Cornell University, Ithaca, New York 14853 USA. [c] Materials Science and Engineering Program, The University of Texas at Austin, Austin, Texas 78712

14:45 I-13_11/I
Mechano-chemical coupling in oxides as energy related materials

Andrey Zuev, Vladimir Sereda, Ivan Ivanov, Dmitry Malyshkin, Dmitry Tsvetkov*

Ural Federal University, Department of Physical and Inorganic Chemistry, Lenin Av. 51, Ekaterinburg, 620000 Russia

15:10 I-13_12/O
Linking layered structure and redox energetics in the cation ordered perovskite oxides $Ca_2AlMnO_{5+\delta}$ ($0<\delta<0.5$)

*Mehdi Pishahang *, Yngve Larring, Anna Lind, Kari Anne Andreassen, Schalk Cloete, Christelle Denonville, Marie-Laure Fontaine*

SINTEF Materials & Chemistry, Forsknigsveien 1, 0314, Oslo, Norway.

15:30 I-13_13/O
Microstructural and phase design of Na-β"-alumina electrolytes for sodium metal halide batteries

Meike V. F. Heinz [a], Marie-Claude Bay [a, c], Lorenzo Pusterla [a], Marta Dai Prè [b], Nicola Zanon [b], Ulrich F. Vogt [a, c], Corsin Battaglia [a]*

[a] Empa, Swiss Federal Laboratories for Materials Science and Technology, Überlandstrasse 129, 8600 Dübendorf, Switzerland. [b] FZSONICK SA, Via Laveggio 15, 6855 Stabio, Switzerland. [c] Albert-Ludwigs-University Freiburg, Institute for Environment and Natural Resources, Crystallography, 79098 Freiburg i.Br., Germany

15:50 BREAK

I-13/4: **Analysis/Technique Development**

Chairman: Krystyn Van Vliet

16:15 I-13_14/I
***In-situ* X-ray diffraction exploration of chemical expansion in thin films of mixed ionic-electronic conducting oxides**

José Santiso, Arindom Chatterjee, Jose Manuel Caicedo, Anna Magrasó*

Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and The Barcelona Institute of Science and Technology (BIST), Campus UAB, Bellaterra, 08193 Barcelona, Spain.

16:40 I-13_15/I
Use of a Non-contact, In-situ, and Electrode-free Wafer Curvature Technique to Perform Simultaneous Stress, Oxygen Surface Exchange Coefficient, Elastic Constant, and Thermo-chemical Expansion Coefficient Measurements on MIEC Films

*Jason D. Nicholas**

Michigan State University, Chemical Engineering & Materials Science Department, 428 South Shaw Lane, 2100 Engineering Building, East Lansing, MI 48824, USA

17:05 I-13_16/I
A Large Scale Electro-chemo-mechanical Analysis of Solid Oxide Fuel Cell Considering Creep Deformation Under Operation

Mayu Muramatsu [a]*, Masami Sato [b], Kenjiro Terada [b], Satoshi Watanabe [a], Keiji Yashiro [a], Tatsuya Kawada [a], Fumitada Iguchi [c], Harumi Yokokawa [d]

[a] Graduate School of Environmental Studies, Tohoku University, 980-8579, Japan. [b] International Research Institute of Disaster Science, Tohoku University, 980-0845, Japan. [c] Graduate School of Engineering Tohoku University, 980-8579, Japan. [d] Institute of Industrial Science, the University of Tokyo, 153-8505, Japan

17:30 I-13_17/O
Chemical Expansion of Praseodymium Doped Ceria Films at High Temperatures

Holger Fritze [a], Silja Schmidtchen [a], Sean Bishop [b], Di Chen [b], Harry L. Tuller [b]*

[a] Technical University of Clausthal, IEPT, Goslar, Germany. [b] Massachusetts Institute of Technology, DMSE, Cambridge MA, USA.

17:50 I-13_18/O
Thermo-chemical expansion of Pr and Gd-doped ceria studied by temperature modulation method

Ashok Kumar Baral and Yoed Tsur*

Department of Chemical Engineering, Technion-Israel Institute of Technology, Haifa-3200003, Israel

I-14 – ELECTROCATALYSIS AT THE ELECTRODE-SOLID ELECTROLYTE INTERFACE

B. Fiore di Botta

Room B4

I-14/5

Chairman: Keith Stevenson

9:00 I-14_16/I
Breakthrough in the Ordinal Straight Choice between High-performance and Durability at Nano-sized Cathode Catalysts for PEFCs

Masahiro Watanabe[(a)], Hiroshi Yano[(a)], Hiroyuki Uchida[(b)]*

[(a)] Fuel Cell Nanomaterials Center, University of Yamanashi, 6-43 Miyamae, Kofu 400-0021, Japan. [(b)] Clean Energy Research Center, University of Yamanashi, 4 Takeda, Kofu 400-8510, Japan.

9:25 I-14_17/I
Non-Precious Metal Catalysts: Cathode Catalyst Layer Design Considerations for High Performance and Stability

Dustin Banham[(a)], Kishimoto Takeaki[(b)], Tetsutaro Sato[(b)], Yoshikazu Kobayashi[(b)], Kumi Narizuka[(b)], Siyu Ye[(a)]*

[(a)] Ballard Power Systems, Research, Burnaby, BC V5J 5J8, Canada. [(b)] Nisshinbo Holdings Inc., Business Development Dept., 1-2-3 Onodai, Midori-ku, Chiba, 267-0056, Japan

9:50 I-14_18/O
Biomimetic Reduction of O_2 at Iron Phthalocyanines Axially Coordinated to Pyridine Anchored on Carbon Nanotubes

*Ricardo Venegas[a], Francisco J. Recio[a], César Zuñiga[a], Jorge Riquelme[b], José F. Marco[c], Ingrid Ponce[b], José H. Zagal[b], Federico Tasca[b]**

[(a)] Facultad de Química, Pontificia Universidad Católica de Chile, Santiago, Chile. [(b)] Facultad de Química y Biología, Universidad de Santiago de Chile, Santiago, Chile. [(c)] Instituto de Química Física "Rocasolano", CSIC, Madrid, Spain

10:10 BREAK

I-14/6

Chairman: Plamen Atanassov

11:00 I-14_19/I
Tuning the Electrocatalytic Activity of Perovskite and Ruddlesden-Popper Oxides for Oxygen Evolution by Cation Substitution

Keith J. Stevenson,[(a)] Robin Forslund[(b)] William G. Hardin,[(c)] Artem Abakumov, [a] Keith P. Johnston[c]*

(a) Center for Electrochemical Energy Storage, Skolkovo Institute of Science and Technology, Moscow, Russian Federation. (b) Department of Chemistry , (c) Department of Chemical Engineering, The University of Texas at Austin, Austin, Texas.

11:25 I-14_20/I
Electrocatalytic and Interfacial Challenges in High pH Environment

Sanjeev Mukerjee, Nagappan Ramasway, Huong Doan and Shraboni Ghoshal*

Northeastern University Center for Renewable Energy Technology, Department of Chemistry and Chemical Biology, Northeastern University, Boston, MA 02048 USA

11:50 I-14_21/O
Solid Acid Proton Conductors: Insights Into Proton Conduction Mechanisms and Advances in Electrode Architectures

Ramez A. Elgammal[a] and Thomas A. Zawodzinski[a,b]*

[(a)] University of Tennessee, Department of Chemical and Biomolecular Engineering, Knoxville, TN 37996, USA. [(b)] Oak Ridge National Laboratory, Materials Science and Technology Division, Oak Ridge, TN 37831, USA

12:10 LUNCH

I-14/7

Chairman: Pawel Kulesza

14:20 I-14_22/I
Improvement of Cell Performance in Low-Pt-Loading PEFC Cathode Catalyst Layers with Pt/Ta-SnO_2 Prepared by the Electrospray Method

Makoto Uchida[(a)] Kent Takahashi[(b)], Katsuyoshi Kakinuma[(a)]*

[(a)] Fuel Cell Nanomaterials Center, University of Yamanashi, Miyamae 6-43, Kofu 400-0021, Japan. [(b)] Interdisciplinary Graduate School of Medicine and Engineering, University of Yamanashi, 4 Takeda, Kofu 400-8510, Japan

14:45 I-14_23/O
Reduced-graphene-oxide-supported gold nanoparticles as active supports for Pt catalysts during electroreduction of oxygen

Pawel J. Kulesza[a], Sylwia Zoladek[a], Iwona A. Rutkowska[a], Magdalena Blicharska[a], Krzysztof Miecznikowski[a], Enrico Negro[b], Vito Di Noto[b]*

[(a)] Faculty of Chemistry, University of Warsaw, Pasteura 1, 02-093 Warsaw, Poland. [(b)] Department of Industrial Engineering, Università degli Studi di Padova in Department of Chemical Sciences, Via Marzolo 1, 35131 Padova, Italy

15:05 I-14_24/O
Hierarchical graphene-based low-loading Pt *"core-shell"* ORR electrocatalysts for proton exchange membrane fuel cells

*Enrico Negro[(a,b)], Angeloclaudio Nale[(a)], Yannick Herve Bang[(a)], Keti Vezzù[(a,c)], Federico Bertasi[(a)], Chuanyu Sun[(a)], Graeme Nawn[(a)], Gioele Pagot[(a,b)], Giuseppe Pace[(d)], Stefano Polizzi[(e)], Vito Di Noto[(a,c)]**

[(a)] Section of Chemistry for Technology, Department of Industrial Engineering, University of Padova, Via Marzolo 9, 35131 Padova, Italy. [(b)] Centro Studi di economia e tecnica dell'energia *"Giorgio Levi Cases"*, Via Marzolo 9, 35131 Padua, Italy. [(c)] INSTM, Via Marzolo 1, 35131 Padova, Italy. [(d)] CNR-ICMATE, Via Marzolo 1, 35131 Padova, Italy. [(e)] Department of Molecular Sciences and Nanosystems and Centre for Electron Microscopy *"G. Stevanato"*, Università Ca' Foscari Venezia, Via Torino 155/B, 30172 Venezia-Mestre, Italy

I-15 – PHOTOCHEMICAL AND PHOTOCATALYTIC ENERGY CONVERSION

A. Padova Fiere

Room A7

I-15/1

Chairman: Ian Sharp

9:00 I-15_1/K
Natural vs artificial photo-electro-chemical pathways for sustainable chemical production processes

Guido Saracco[(a)], Simelys Hernandez[(a,b)]*

[(a)] Istituto Italiano di Tecnologia, Centre for sustainable Future Technologies, Corso Trento 21, Italy. [(b)] Politecnico di Torino, Department of Applied Sceince and Technology, Corso Duca degli Abruzzi 24, Italy.

9:30 I-15_2/K
Innovations and Limitations in Solid-State Ionics for Photoelectrochemical Applications

*William White[(a)], Christopher D. Sanborn[(a)], Ronald S. Reiter[(a)], Shane Ardo[(a),(b)]**

University of California at Irvine, [(a)] Department of Chemistry, and [(b)] Department of Chemical Engineering and Materials Science, Irvine, CA, USA

10:00 I-15_3/O
Solid-State Architecture for a High-Current, Elevated-Temperature Photoelectrochemical Cells

Madhur Boloor, Xiaofei Ye, Liming Zhang, Nicholas A. Melosh and William C. Chueh*

Stanford University, Materials Science and Engineering, 496 Lomita Mall, Stanford, CA 94305, United States of America.

10:20 I-15_4/O
Dye Sensitized Photoelectrochemical Water Splitting Utilizing Metal Oxide Doped TiO_2 Nanotubes

Raman. Vedarajan[1], Shoto. Ikeda[1], Rohit K. Gagan[1,2], Noriyoshi. Matsumi[1]

1. School of Materials Science, Japan Advanced Institute of Science and Technology (JAIST), 1-1 Asahidai, Nomi, Ishikawa, JAPAN, 923-1292. 2. Department of Chemistry, Delhi Unveristy, India.

10:40 BREAK

I-15/2

Chairman: Shane Ardo

11:00 I-15_5/K
Colloidal chemistry to advance solar-to-chemicals conversion studies

*Raffaella Buonsanti**

Department of Chemical Sciences and Engineering, École Polytechnique Fédérale de Lausanne, Sion, CH-1950

11:30 I-15_6/K
Elemental distribution and excited state dynamics in oxynitride nanocrystals

Gordana Dukovic[(a)], Pornthip Tongying[(a)], Chi-Hung Chuang[(a)], Jim Ciston[(b)]*

[(a)] Department of Chemistry and Biochemistry, University of Colorado Boulder, UCB 215, Boulder, CO, 80309 USA [(b)] Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

12:00 I-15_7/O
Photoelectrochemistry of colloidal TiO_2: towards photocatalytic rates of single anatase nanoparticles

Mario A. Alpuche-Aviles, Krishna Barakoti, Pushpa Chhetri, Ganesh Rana*

Department of Chemistry, University of Nevada, Reno, Nevada, 89557, United States of America

12:20 I-15_8/O
Photo-Induced Ostwald Ripening of Pt Nanoparticles on TiO_2 During Liquid Phase Photocatalysis

*Liuxian Zhang, Qianlang Liu and P. A. Crozier**

Arizona State University, School for Engineering of Matter, Transport and Energy, Tempe, Arizona 85283, USA

12:40 LUNCH

I-15/3

Chairman: Holger Dau

14:20 I-15_9/K
Shining light into the reaction mechanisms of metal oxides photoanodes

*Laia Francàs*and James R. Durrant*

Department of Chemistry, Imperial College London, London SW7 2AZ, United Kingdom

14:50 I-15_10/K
Investigating Solid/Liquid Interfaces with *In-Situ* Electron Spectroscopies

Marco Favaro, Fatwa Firdaus Abdi, David E. Starr, Roel van de Krol*

Helmholtz Zentrum Berlin für Materialien und Energie GmbH, Institute for Solar Fuels, Hahn-Meitner-Platz 1, D-14109 Berlin, Germany

15:20 I-15_11/K
Dynamic Characterization of Hematite Photoanodes for Solar Water Splitting

Dino Klotz, Avner Rothschild*

Department of Materials Science and Engineering, Technion – Israel Institute of Technology, 3200003 Haifa, Israel.

15:50 BREAK

I-15/4

Chairman: Gordana Dukovic

16:15 I-15_12/K
Ta_3N_5: a promising photoanode material for solar-driven water splitting

Yanbo Li

Institute of Fundamental & Frontier Sciences, University of Electronic Science & Technology of China, Chenghua District, Chengdu 610054, China

16:45 I-15_13/K
Water oxidation with polyoxometalates, the molecular metal oxides

Andrea Sartorel[(a)], Marcella Bonchio[(a)]*

[(a)] Department of Chemical Sciences, University of Padova, via Marzolo 1, 35131 Padova, Italy.

17:15 I-15_14/K
Combinatorial and High Throughput Discovery of Integrated Solar Fuel Photoanodes

Joel A. Haber,[(a)] Dan Guevarra,[(a)] Aniketa Shinde,[(a)] Lan Zhou,[(a)] Guo Li,[(b)] Guiji Liu,[(b)] Ian D. Sharp,[(b)] Francesca M. Toma, [(b)] Jeffery B. Neaton,[(b)] John M. Gregoire[(a)]

[(a)] Joint Center for Artificial Photosynthesis, California Institute of Technology, Pasadena, CA, 91125, USA. [(b)] Joint Center for Artificial Photosynthesis, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA

17:45 I-15_15/O
The Photo-electrochemical Properties of Methylammonium Lead Tribromide Perovskite Materials Governed by Ion Migration and Its Application to Photo-electrochemical Devices

*Kai Wang[a)], Yuiga Nakamura[b)], Takashi Kondo [b)], and Shu Yamaguchi [a)]**

a) The Univ. of Tokyo, Dept. of Mater. Eng., Hongo 7-3-1, Bunkyo-Ku, Tokyo 113-8656, Japan. b) The Univ. of Tokyo, RCAST, Komaba 4-6-1, Meguro-Ku, Tokyo 153-8904, Japan

MACRO AREA 2: IONICS IN COMMUNICATION AND ROBOTICS

II-2 – REALIZATION OF NEW FUNCTIONAL OPTOELECTRONIC OXIDE BASED MATERIALS: EXPERIMENT AND THEORY

B. Fiore di Botta

Room B2

II-2/1

Chairman: David Ginley

14:20 II-2_1/I
Reactive sputter depositions of various TCOs, photocatalysts and thermochromic films

Yuzo Shigesato and Junjun Jia*

Graduate School of Science and Engineering, Aoyama Gakuin University, 5-10-1 Fuchinobe, Sagamihara, Kanagawa, 252-5258 Japan

14:45 II-2_2/I
Exploration of ternary semiconducting oxides by compositional screening

Holger von Wenckstern*

Universtiät Leipzig – Felix-Bloch-Institut für Festkörperphysik, Linnéstrasse 5, 04103 Leipzig, Germany

15:10 II-2_3/O
Electrochemistry meets Photonics: searching a new path for optical actuators

Marina Muñoz-Castro[(a)], Hartmut Bracht[(a)], Annika Buchheit[(b)], Britta Teßmer[(b)], Hans-Dieter Wiemhöfer[(b)], Marc Sorel[(c)], Francesco Morichetti[(d)], Andrea Melloni[(d)]*

[(a)]University of Münster, Institute of Materials Physics, Wilhelm-Klemm-Str. 10, 48149 Münster, Germany. [(b)]University of Münster, Institute of Inorganic and Analytical Chemistry, Corrensstraße 28/30, 48149 Münster, Germany. [(c)]University of Glasgow, School of Engineering, James Watt South Building, Glasgow G12 8QQ, UK. [(d)]Politecnico di Milano, Dipartimento di Elettronica Informazione e Bioingegneria, Via Ponzio 34/5, 20133 Milano, Italy

15:30 II-2_4/O
A unifying perspective of oxygen vacancies in semiconducting and insulating oxides

*Christoffer Linderälv, Anders Lindman, Paul Erhart**

Chalmers University of Technology, Department of Physics, SE-412 96 Gothenburg, Sweden

15:50 BREAK

II-2/2

Chairman: David Ginley

16:15 II-2_5/I
The Physical Properties of Zinc Tin nitride/oxynitride thin films and their optoelectronics applications

Lingyan Liang[(a)], Yufang Xie[(a, b)], Hongtao Cao[(a)]*

[(a)] Ningbo Institute of Material Technology and Engineering, Chinese Academy of Sciences, Division of Functional Materials and Nano Devices, Ningbo 315201, China. [(b)] University of Science and Technology of China, Nano Science and Technology Institute, Suzhou 215123, China

16:40 II-2_6/O
Ta_2O_5 thin films for all-solid state electrochromic devices

Gamze Atak[(a)], Özlem Duyar Coşkun[(b)]*

[(a, b)] Hacettepe University, Physics Engineering Department, Thin Film Preparation and Characterization Laboratory Beytepe. Çankaya, 06800 Ankara, Turkey

17:00 II-2_7/O
Vibration energy harvesters with integrated tuning devices

Alberto Doria, Cristian Medè, Daniele Desideri, Alvise Maschio, Federico Moro

University of Padova, DII, Via Venezia 1 35131 Padova, Italy

II-3 – THE SCIENCE AND TECHNOLOGY OF 2D MATERIALS

B. Fiore di Botta

Room M3

II-3/1

Chairman: Francesco Bonaccorso

16:15 II-3_1/K
Perspectives on the Growth of Two-Dimensional Materials

Luigi Colombo

Texas Instruments, Analog Technology Development, 13121 TI Blvd MS 365, Dallas, 75243 (USA)

16:45 II-3_2/I
Wafer scale synthesis of 2D transition metal dichalcogenides based on vapor phase reaction and their applications

*Hyungjun Kim**

School of Electrical and Electronic Engineering, Yonsei University, 50 Yonsei Ro, Seoul, Republic of Korea

17:10 II-3_3/I
Additive Free, Single Layer Graphene in Water & Few Graphene layers from Food Waste

*Alain Pénicaud**

Centre de Recherche Paul Pascal – CNRS, Université de Bordeaux, France

17:35 II-3_4/O
TMD-Graphene Heterostructures: Fabrication by Direct CVD

G. V. Bianco[1], M. Losurdo[1], M. M. Giangregorio[1], A. Sacchetti[1], G. Pace[1], P. Capezzuto[2], G. Bruno[1]*

[1]Institute of Nanotechnology, CNR-NANOTEC, via Orabona, 4 70126 Bari, Italy. [2]Department of Chemistry, University of Bari, via Orabona, 4 70126 Bari, Italy

17:55 II-3_5/O
Electronic properties of the WS_2/Graphene heterostack

Stiven Forti[(a)], A. Rossi[(a, b)], H. Büch[(a)], T. Cavallucci[(b, c)], U. Starke[(d)], A. Locatelli[(e)], V. Tozzini[(c)] and C. Coletti[(a, f)]

[(a)] Centre for Nanotechnology InnovationIIT@NEST, Piazza San Silvestro 12, 56127 Pisa (Italy). [(b)] Scuola Normale Superiore, NEST, Piazza San Silvestro 12, 56127 Pisa (Italy). [(c)] NEST, Istituto Italiano Nanoscienze CNR-NANO, Piazza San Silvestro 12, 56127 Pisa (Italy). [(d)] Max Planck Institut für Festkörperforschung, Heisenbergstr. 1, 70569 Stuttgart (Germany). [(e)] Elettra – Sincrotrone Trieste S. C. p. A., Basovizza, 34149 Trieste, Italy. [(f)] Graphene Labs, Istituto Italiano di Tecnologia, via Morego 30, 16163 Genova, Italy

18:15 II-3_6/O
Graphene on Ni(100): coexistence of different moiré patterns at a symmetry-mismatched interface

Virginia Carnevali[1,2], Z. Zhiy[3], M. Jugovac[1,#], L. Patera[1,§], G. Soldano[4], M. Marisc[4], C. Africh[4], G. Comell[1], M. Peressi[1]

[1] Università di Trieste, Via A. Valerio 2, Trieste, Italy. [2] CNR-IOM TASC, Trieste. [3] ICTP, Trieste. [4] Universidad Nacional de Cordoba, and INFIQC CONICET-UNC, Argentina. # present address: Peter Grünberg Institut, Forschungszentrum Jülich, Deutschland. § present address: Faculty of Physics, University of Regensburg, Deutschland

II-4 – IONICS OF MEMRISTOR/RESISTIVE SWITCHES

B. Fiore di Botta

Room B3

II-4/1

Chairman: Shu Yamaguchi

9:00 II-4_1/K
Memristor is Non-Volatile *iff* its POP is Flat

*Leon Chua**

Professor – University of California, Berkeley, CA 94720, USA

9:30 II-4_2/I
New types of gap-type atomic switches using molecular layers

Tsuyoshi Hasegawa[(a,b)], Carolin Lutz[(b)], Ayana Suzuki[(a)], Ai Kassai[(a)], Tohru Tsuruoka[(c)]*

[(a)] Waseda University, Department of Applied Physics, 3-4-1 Okubo, Shinjuku-ku, Tokyo 169-8555, Japan. [(b)] Waseda University, Department of Nano Science and Engineering, 3-4-1 Okubo, Shinjuku-ku, Tokyo 169-8555, Japan. [(c)] National Institute for Materials Science, WPI Center for Materials Nanoarchitectonics, 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan.

9:55 II-4_3/I
Threshold and Memory Switching in Oxide-Based Devices

*Jonghan Kwon[(a)], Abhishek A. Sharma[(b)], Jonathan M. Goodwill[(a)], Dasheng Li, James A. Bain[(b)], and Marek Skowronski[(a)]**

[(a)] Carnegie Mellon University, Dept. Materials Science & Eng., Pittsburgh, PA 15213, USA. [(b)] Carnegie Mellon University, Dept. Electrical & Computer Eng., Pittsburgh, PA 15213, USA

10:20 II-4_4/O
Mobile Ions, Reaction Sequence and Passivation in Memristive Devices

*Michael Lübben[(a)], Stefan Tappertzhofen[(a)], Anja Wedig[(b)] and Ilia Valov[(b)] **

[(a)] Institut für Werkstoffe der Elektrotechnik II, RWTH Aachen University, Sommerfeldstr. 18/24 52074 Aachen, Germany. [(b)] Peter-Grünberg Institut 7, Forschungszentrum Jülich, 52425 Jülich, Germany.

10:40 BREAK

II-4/2

Chairman: Shu Yamaguchi

11:00 II-4_5/I
Roles of conducting filament and non-filament regions in the Ta_2O_5 and HfO_2 resistive-switching memory for switching reliability

Tae Hyung Park[(a)] and Cheol Seong Hwang[(a),]*

[(a)] Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, Seoul National University, Seoul 151-744, Republic of Korea

11:25 II-4_6/I
Searching for novel functions and applications of solid state ionics

Takashi Tsuchiya, Tohru Tsuruoka, Kazuya Terabe, and Masakazu Aono*

International Center for Materials Nanoarchitechtonics (WPI-MANA), National Institute for aterials Science (NIMS), Tsukuba, Ibaraki 305-0044, Japan

11:50 II-4_7/O
Influence of the Oxygen Defect Levels on Switching and Current Transport Properties in Valence Change Memory Cells

Stephan Menzel[(a)], Carsten Funcke[(b)], Astrid Marchewka[(b)], Christoph Bäumer[(a)], Peter C. Schmidt[(c)], Manfred Martin[(d)], Regina Dittmann[(a)], Rainer Waser[(a,b)]*

[(a)] Peter Grünberg Institut (PGI-7), Forschungszentrum Juelich, 52425 Juelich, Germany. [(b)] Institut für Werkstoffe der Elektrotechnik (IWE 2), RWTH Aachen, 52062 Aachen, Germany. [(c)] Physikalische Chemie, TU Darmstadt, 64289 Darmstadt, Germany. [(d)] Institut für Physikalische Chemie, RWTH Aachen, 52062 Aachen, Germany

12:10 II-4_8/O
Resistive switching and electrochemical polarization

*Manfred Martin**

Institute of Physical Chemistry, RWTH Aachen University, 52074 Aachen, Germany

12:30 LUNCH

II-4/3

Chairman: Ilia Valov

14:20 II-4_9/I
Atomistic Simulations for Understanding Microscopic Mechanism of Amorphous TaO_x-based Resistive Switching Systems

*Satoshi Watanabe**

Department of Materials Engineering, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan, and Center for Materials Research by Information Integration, National Institute for Materials Science, Japan.

14:45 II-4_10/I
Resistive switching triggered by bulk ion conduction of amorphous gallium oxide thin films

Yoshitaka Aoki[(a),(b)], Chiharu Kura[(c)*], Manfred Martin[(d)]*

[(a)] Faculty of Engineering, Hokkaido University, N13W8 Kita-ku, Sapporo, 060-8628, Japan. [(b)] JST-PRESTO,4-1-8 Honcho, Kawaguchi, 3320012 Japan. [(c)] Graduate School of Chemical Science & Engineering, Hokkaido University, N13W8 Kita-ku, Sapporo, 060-8628, Japan. [(d)] Institute of Physical Chemistry, RWTH Aachen University and JARA-FIT, 52056 Aachen, Germany.

15:10 II-4_11/O
Implicating Diffusion Kinetics for Oxide-Based Memristors

Jennifer L. M. Rupp[(a)], Felix Messerschmitt[(a,b)], Andreas Nenning[(a,b)], Sebastian Schweiger[(b)], Rafael Schmitt[(b)], Reto Pfenninger[(a,b)], Roman Korobko[(b)], Eva Sediva[(a,b)], William Bowman[(a)]*

[(a)] Massachusetts Institute of Technology, Department of Materials Science and Engineering, Cambridge, Massachusetts 02139, United States. [(b)] ETH Zürich, Department of Materials, Hönggerbergring 64, 8093 Zürich

15:30 II-4_12/O
The role of oxygen vacancy mobility in the oxide bulk and electrode interfaces of ceria-based memristive devices

Andreas Nenning[(a,b)], Rafael Schmitt[(b)], Roman Korobko[(b)], Jennifer L. M. Rupp [(a)]*

[(a)] Massachusetts Institute of Technology, Department of Materials Science and Engineering, Cambridge, Massachusetts 02139, United States. [(b)] ETH Zürich, Department of Materials, Hönggerbergring 64, 8093 Zürich

15:50 BREAK

II-4/4

Chairman: Ilia Valov

16:15 II-4_13/I
Oxygen thermomigration in acceptor(Sc)-doped perovskite, $Ca_{0.90}Sc_{0.10}TiO_{2.95+\delta}$ ("Cross-effect" phenomenon)

*Donghoon Shin, Han-Ill Yoo**

Department of Materials Science and Engineering, Seoul National University, Seoul 151-744, Korea

16:40 II-4_14/O
Stoichiometry-dependence of resistive switching in gallium oxide

Hein Philipp[(a)], Martin Manfred[(a)]*

[(a)] RWTH Aachen University, Institute of Physical Chemistry, Landoltweg 2, 52074 Aachen, Germany.

17:00 II-4_15/O
Effects of Oxygen Vacancies on the Electronic Structure of Metal Insulator Metal (MIM) Systems, and the Formation of a Conductive Filament

*Handan Yildirim and Ruth Pachter**

Air Force Research Laboratory, Materials and Manufacturing Directorate, Wright-Patterson Air Force Base, Ohio, 45433 USA

17:20 II-4_16/O
Device asymmetries in $SrTiO_3$-based thin-film resistive switches: Influence of environment and defects at interfaces

E.Sediva[(a),(b)], W.Bowman[(a),(c)], J.L.M. Rupp[(a),(b)]*

[(a)] Electrochemical Materials, ETH Zurich, Hönggerbergring 64, 8093, Zurich, Switzerland. [(b)] Department of Materials Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge, MA, 02139, USA. [(c)] School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, AZ, 85287, USA

MACRO AREA 3: IONICS IN BIOLOGICAL SYSTEMS AND LIFE SCIENCES

III-2 – MATERIALS TO MODULATE IONIC TRANSPORT IN BIOLOGICAL SYSTEMS

B. Fiore di Botta

Room B8

III-2/1

Chairman: Plamen Atanassov

9:00 III-2_1/K
Electrical Properties of Nucleic Acids: Electrochemical Studies and Biosensor Applications

*Elena E. Ferapontova**

Aarhus University, Interdisciplinary Nanoscience Center (iNANO), Gustav Wieds Vej 1590-14, DK-8000 Aarhus C, Denmark

9:30 III-2_2/I
Highly Sensitive, Stable and Selective Hydrogen Peroxide Amperometric Biosensor based on Peroxidases from different sources wired by Os-polymer: a comparative study

*Paolo Bollella[(a)], Luca Medici[(c)], Andrey A. Poloznikov[(c)], Dmitry M. Hushpulian[(c)], Rafael Andreu[(c)], Dónal Leech[(d)], Massimo Marcaccio[(e)], Lo Gorton[(b)], Riccarda Antiochia[(a)], **

[(a)] Department of Chemistry and Drug Technologies, Sapienza University of Rome, P. le Aldo Moro 5, 00185 - Rome, Italy. [(b)] Department of

Analytical Chemistry/Biochemistry and Structural Biology, Lund University, P. O. Box 124, SE-221 00 Lund, Sweden. [c] D. Rogachev center of Pediatric Hematology, Oncology and Immunology, 1 Samory Mashela strasse, Moscow 117997, Russia. [d] School of Chemistry, and Ryan Institute, National University of Ireland, Galway, Ireland. [e] Department of Chemistry "Giacomo Ciamician", University of Bologna, Via Selmi 2, 40126 - Bologna, Italy

9:55 III-2_3/I
Electrochemical Study of the Extracellular Electron Transfer of Wild Type and Mutants of *Enterococcus faecalis* to Electrodes

*Galina Pankratova, [a] Ross D. Milton [b] Shelley D. Minteer, [b] Dónal Leech, [c] Lars Hederstedt[d] and Lo Gorton[a]**

[a] Department of Biochemistry, Lund University, Sweden. [b] Chemistry and Materials Science and Engineering, University of Utah, USA. [c] School of Chemistry, National University of Ireland Galway, Ireland. [d] Department of Biology, Lund University, Sweden.

10:20 III-2_4/O
Supercapacitive Microbial Desalination Cell

Carlo Santoro[a], Mounika Kodali[a], Fernando Benito Abad[a], Alexey Serov [a], Francesca Soavi[b], Plamen Atanasson[a]*

[a] Department of Chemical and Biological Engineering, Center for Micro-Engineered Materials (CMEM), University of New Mexico, Albuquerque, NM 87131, USA. [b] Department of Chemistry "Giacomo Ciamician", Alma Mater Studiorum – Universita` di Bologna, Via Selmi, 2, 40126 Bologna, Italy

10:40 BREAK

III-2/2

Chairman: Pierangela Cristiani

11:00 III-2_5/K
Bioelectrochemical Systems for the recovery of nutrients and energy

Tom Sleutels[a,], Annemiek ter Heijne[a, b], Philipp Kuntke[a], Bert Hamelers[a], Cees Buisman[a, b]*

[a] Wetsus, European centre of excellence for sustainable water technology, Oostergoweg 9, 8911 CC Leeuwarden, The Netherlands. [b] Sub-department of environmental technology Wageningen University Bornse weilanden 9, 6700 AA Wageningen, The Netherlands

11:30 III-2_6/I
Lowering the voltage of a scalable MEC fed with municipal wastewater by catalyzing the hydrogen evolution by weak acid solutions

Benjamin Erable[a], Emma Roubaud[a], Serge Da Silva[b], Rémy Lacroix[b], Alain Bergel[a], Régine Basséguy[a]*

[a] Laboratoire de Génie Chimique, CNRS, Université de Toulouse, 4 allée Emile Monso, 31432 Toulouse cedex 04, France. [b] 6T-MIC Ingénieries, 4 rue Brindejonc des Moulinais, 31500 Toulouse, France

11:55 III-2_7/O
Ligno-cellulosic Ionic Conductors for Microbial Fuel Cells Applications

*Stefania Marzorati *[a, d], Stefano Trasatti [b, d], Andrea Schievano [a, d], Pierangela Cristiani [c, d]*

[a] Università degli Studi di Milano-Department of Agricultural and Environmental Sciences, via Celoria 2, 20133 Milan, Italy. [b] Università degli Studi di Milano-Department of Chemistry, via Golgi 19, 20133 Milan, Italy. [c] RSE-Ricerca sul Sistema Energetico S. p. A., via Rubattino, 54, 20100 Milano, Italy. [d] Microbial Electrochemical Systems Research Center-Milan (MiMES Center), Università degli Studi di Milano, Via Celoria 2 20133, Milan, Italy

12:15 III-2_8/O
Oxygen Reduction Reaction Over Nanostructured Carbon Catalysts in Microbial Fuel Cells

Barbara Mecheri[a], Maida AC de Oliveira[a], Valerio Ficca[a], Alessandra D'Epifanio [a], Ernesto Placidi[b, c], Fabrizio Arciprete[b], Silvia Licoccia[a]*

[a] University of Rome Tor Vergata – Dept. Chemical Science and Technologies, Via della Ricerca Scientifica, 00133 Rome, Italy. [b] University of Rome Tor Vergata – Dept. Physics, Via della Ricerca Scientifica, 00133 Rome, Italy. [c] CNR-ISM, Via Fosso del Cavaliere 100, I-00133 Rome, Italy

12:35 LUNCH

III-2/3
Chairman: Carlo Santoro

14:20 III-2_9/I
Toward standardization of biofilm electrochemistry: experiences with screen-printed electrodes and short-term experiments

Lucinda E. Doyle[a], Kannan Palanisamy[a], Lam Ling Ning[a, c], Kimberly Kline[a, b], Enrico Marsili[a, c],*

[a] Nanyang Technological University, Singapore Centre for Environmental Life Sciences Engineering, 60 Nanyang Drive, 637551, Singapore. [b] Nanyang Technological University, School of Biological Sciences, 60 Nanyang Drive, 637551, Singapore. [c] Nanyang Technological University, School of Chemical and Biomedical Engineering, 62 Nanyang Drive, 637459, Singapore

14:45 III-2_10/I
Microbial fuel cells for environmental application

Pierangela Cristiani[a], Andrea schievano[b], Stefania Marzorati[b], Andrea Goglio[b], Stefano Trasatti[c]*

[a] Ricerca Sul Sistema Energetico – RSE SpA, via Rubattino 54, 20134, Milano, Italy. [b] Department of Agricultural and Environmental Science, Università degli Studi di Milano, v. Celoria 2, 20133, Milano, Italy. [c] Department of Chemistry, Università degli Studi di Milano, v. Celoria 2, 20133, Milano, Italy

15:10 III-2_11/O
Tetrabutylammonium-modified Aquivion Ionomers for Enzyme Immobilization for Bioelectrocatalysis Applications

Shelley D. Minteer[a]*, Rong Cai[a], Sofiene Abdellaoui[a], Jay Kitt[a], Joel Harris[a], and Carol Korzeniewski[b]

[a] Department of Chemistry, University of Utah, Salt Lake City, UT, USA. [b] Department of Chemistry, Texas Tech University, Lubbock, TX, USA.

15:30 III-2_12/O
Materials Enabling Solutions for Hybrid Bio-Catalytic Cascades

*Plamen Atanasson**

Center for Micro-Engineering Materials (CMEM) and Chemical & Biological Engineering Department, Advanced Materials Laboratory, University of New Mexico, Albuquerque, NM 87131

15:50 BREAK

III-2/4

Chairman: Shelley Minteer

16:15 III-2_13/I
Self-Assembled Peptide Nanostructures: Model Systems to Study Proton Transport in Biomaterials

*Ohad Silberbush, Subhasish Roy, Moran Amit and Nurit Ashkenasy**

Department of Materials Engineering and the Ilse Katz Institute for Nanoscale Science & Technology, Ben Gurion University of the Negev, Beer- Sheva-8410501, Israel

16:40 III-2_14/O
Municipal Wastewater treatment in microbial fuel cells (MFC) with algal biocathode: a synergic strategy

Simone Angioni[a], Luca Millia[a], Niccolò Pianta[a], Marta Temporiti[b], Eliana Quartarone[a], Piercarlo Mustarelli [a]*

[a] University of Pavia, Department of Chemmistry, Via Taramelli, 12, 27100, Pavia, Italy. [b] University of Pavia, Department of Microbiology, Via Ferrata, 1, 27100, Pavia, Italy

17:00 III-2_15/O
Non-covalent Functionalization of Carbon Nanotubes with Redox Active Species for Enzymatic Bioelectrocatalysis

Fabien Giroud[a], Andrew J. Gross[a], Xiaohong Chen[a], Koichi Sawada[b], Masahito Taya[b], Serge Cosnier[a]*

[a] Université Grenoble Alpes, CNRS, DCM UMR 5250, F-38000 Grenoble, France. [b] Department of Materials Science and Engineering, Graduate School of Engineering Science, Osaka University, 1-3 Machikaneyama-cho, Toyonaka, Osaka 560-8531, Japan

17:20 III-2_16/O
Protonics in Biopolymer "Collagen"

Yasumitsu Matsuo, Hiroki Ikeda, Takashi Kawabata, Junko Hatori and Hiroshi Oyama*

Faculty of Science & Engineering, Setsunan University, 17-8 Ikeda-Nakamachi, Neyagawa, Osaka, 572-8508, Japan

MACRO AREA 4: GENERAL ASPECTS, FUNDAMENTALS AND THEORY IN ION-CONDUCTING MATERIALS

IV-1 – MODELLING AND SIMULATION OF ION-CONDUCTING MATERIALS

B. Fiore di Botta

Room B5

IV-1/5

Chairman: Stephen Paddison

9:00 IV-1_18/K
Molecular modeling of aqueous, solid and ionic liquid battery electrolytes

*Oleg Borodin,[a, *] Jenel Vatamanu,[a] Marco Olguin,[a] Claire Eisner,[b] Jaroslaw Knap,[b] Liumin Suo,[c] Chunsheng Wang,[d] Kang Xu[a]*

[a] Electrochemistry Branch, Sensor and Electron Devices Directorate, U. S. Army Research Laboratory, Adelphi, MD, 20783, USA. [b] Simulation Sciences Branch, US Army Research Laboratory, Aberdeen Proving Ground, MD, 21005-5066, USA. [c] Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, 02138. [d] Department of Chemical and Biomolecular Engineering, University of Maryland College Park, MD, 20740, USA

9:30 IV-1_19/I
DFT and DFTB simulations of lithium ion transport through the complex electrode/SEI/electrolyte interface

Yue Qi[a], Yunsong Li[a], Jie Pan[b]*

[a] Department of Chemical Engineering and Materials Science, Michigan State University, East Lansing, MI 48824, USA. [b] Department of Chemical & Materials Engineering, University of Kentucky, Lexington, KY 40506, USA

9:55 IV-1_20/O
Fast Li-ion conduction in Li-rich NASICON-type solid electrolyte: First-principles molecular dynamics simulations

Yusuke Noda[a], Masanobu Nakayama[a-d]*

[a] "Materials research by Information Integration" Initiative (MI2I), National Institute for Materials Science (NIMS), Tsukuba, Ibaraki 305-0047, Japan. [b] Department of Life Science and Applied Chemistry, Nagoya Institute of Technology, Nagoya, Aichi 466-8555, Japan. [c] Global Research Center for Environment and Energy based on Nanomaterials Science (GREEN), National Institute for Materials Science (NIMS), Tsukuba, Ibaraki 305-0047, Japan. [d] Elements Strategy Initiative for Catalysts and Batteries (ESICB), Kyoto University, Kyoto 615-8245, Japan

10:15 IV-1_21/O
Holistic computational structure screening of more than 12,000 candidates for solid lithim-ion conductor materials

Austin D. Sendek [a], Qian Yang [b], Ekin D. Cubuk(c), Karel-Alexander N. Duerloo[c], Yi Cui[c], Evan J. Reed[c]*

[a] Stanford University Department of Applied Physics, 348 Via Pueblo Mall, Stanford, CA, USA 94305. [b] Stanford University Institute for Computational and Mathematical Engineering, 475 Via Ortega, Stanford, CA, USA 94305. [c] Stanford University Department of Materials Science and Engineering, 496 Lomita Mall, Stanford, CA, USA 94305.

10:35 BREAK

IV-1/6

Chairman: Oleg Borodin

11:00 IV-1_22/K
Toward design principles for anion exchange membranes with high hydroxide conductivity

Mark E. Tuckerman[a, b, c], Tamar Zelovich[a], Zhuoran Long[a], Stephen J. Paddison[d], Michael A. Hickner[e], Chulsung Bae[f]*

[a] Department of Chemistry, New York University, New York, NY 10003, USA. [b] Courant Institute of Mathematical Science, New York University, New York, NY 10012, USA. [c] NYU-ECNU Center for Computational Chemistry at NYU Shanghai, Shanghai 200062, China. [d] Department of Chemical and Biological Engineering, University of Tennessee Knoxville, Knoxville, TN 37996, USA. [e] Department of Materials Science and Engineering, Pennsylvania State University, University Park, PA 16802, USA. [f] Department of Chemistry and Chemical Biology, Rensselaer Polytechnic Institute, Troy, NY 12180, USA

11:30 IV-1_23/O
Morphology of Polymerized Ionic Liquids from Scattering: An Atomistic Simulation Perspective

*Hongjun Liu and Stephen J. Paddison**

Department of Chemical and Biomolecular Engineering, University of Tennessee, Knoxville, TN 37996, USA

11:50 IV-1_24/O
Transport of ions in a mixed Na^+/K^+ ion conducting glass - electrodiffusion profiles and electrochemical interphase formation

*Johannes Martin [a], Sarah Mehrwald [a], Martin Schäfer [a], Thilo Kramer [b], Christian Jooss [b], Karl-Michael Weitzel[a] **

[a] Philipps Universität Marburg – Chemistry Department, Marburg, Germany. [b] Georg-August Universität Göttingen – Institute for Material Physics, Göttingen, Germany

12:10 IV-1_25/O
Glass structure and characteristic connectivity of mobile ions in fast ion-conducting chalcogenide glasses

*Takeshi Usuki[a] *, Hiroya Ichijo[b], Yohei Onodera [c], Masaru Aniya [d]*

[a] Faculty of Science, Yamagata University, Yamagata 990-8560, Japan. [b] Graduate School of Science and Engineering, Yamagata University, Yamagata 990-8560, Japan. [c] Research Reactor Institute, Kyoto University, Osaka 590-0494, Japan. [d] Faculty of Advanced Science and Technology, Kumamoto University, Kumamoto 860-8555, Japan.

12:30 LUNCH

IV-3 – INTERFACIAL PROCESSES AND NANOIONICS

B. Fiore di Botta

Room B5

IV-3/1

Chairman: Joachim Maier

14:20 IV-3_1/K
Atomic-Scale Surface Science Investigations of Fundamental Processes in Solid State Ionics

*Ulrike Diebold**

Institute of Applied Physics, TU Wien, Wiedner Hauptstrasse 8-10/134, A-1040 Vienna, Austria

14:50 IV-3_2/I
In situ TEM and X-ray spectroscopy studies of manganite perovskite electro-catalysts for water oxidation

Christian Jooss[1], Daniel Mierwaldt[1], Vladimir Roddatis [1], Julius Scholz[1], Marcel Risch[1], Stephanie Mildner[1] and Peter Blöch[2]*

[1] Inst. of Materials Physics, Univ. of Goettingen, Friedrich-Hund-Platz 1, 37077 Goettingen, Germany. [2] Institute of Theoretical Physics, Technical University of Clausthal, Germany

15:15 IV-3_3/O
Modification of Schottky barrier heights during resistance degradation of Fe-doped $SrTiO_3$

*Ruth Giesecke, Binxiang Huang, Issei Suzuki, Andreas Klein **

[a] Technische Universität Darmstadt, Institute of Materials Science, Jovanka-Bontschits-Str. 2, 64287 Darmstadt, Germany

15:35 IV-3_4/O
Electrodiffusion versus chemical diffusion in alkali calcium phosphate glasses – implication of structural changes

*Anneli Hein[a], Johannes Martin[a], Martin Schäfer[a], Karl-Michael Weitzel[a]**

[a] Philipps Universität Marburg - Chemistry Department, Marburg, Germany.

15:55 BREAK

IV-3/2

Chairman: Rotraut Merkle

16:15 IV-3_5/I
The influence of interfaces on H/Li insertion phase behavior and nucleation and growth in H and Li storage materials

Fokko Mulder[a], Marnix Wagemaker[b], Ad van Well[b], Bernard Dam[a], Stephan Eijt[b], Lars Bannenberg[b], Swapna Ganapathy[b]*

[a] Delft University of Technology, Chemical Engineering, van der Maasweg 9, 2629HZ, Delft, The Netherlands. [b] Delft University of Technology, Radiation Science and Technology, Mekelweg 15, 2629JB, Delft, The Netherlands.

16:40 IV-3_6/O
Interfacial polarization caused by proton conduction in hydroxyapatite and its application for electret formation

Naohiro Horiuchi, Kosuke Nozaki, Miho Nakamura, Akiko Nagai, and Kimihiro Yamashita*

Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, 2-3-10 Kanda surugadai, Chiyoda-ku, Tokyo 101-0062, Japan.

17:00 IV-3_7/O
Characterization of $Y_2Zr_2O_7$ single layers and YSZ/$Y_2Zr_2O_7$ multilayers: grain boundaries and strain contributions to the ionic conductivity

Elisa Gilardi, Giuliano Gregori, Joachim Maier*

Max Planck Institute for Solid State Research, Stuttgart, Germany

17:20 IV-3_8/O
Effect of field-assisted sintering on the defect chemistry of nanostructured $SrTiO_3$-based materials

*Kurt Klauke[a], Bugra Kayaalp[a], Alessandro Iannaci [b], Vincenzo M. Sglavo[b] and Simone Mascotto[a]**

[a] Institute of Inorganic and Applied Chemistry, University of Hamburg, Martin-Luther-King-Platz 6, 20146 Hamburg, Germany. [b] Department of Industrial Engineering, University of Trento, via Sommarive 9, 38123 Trento, Italy

17:40 IV-3_9/O
Evaluation of Mn-based Oxides for the Oxygen Storage Technology

Alicja Klimkowicz[a], Konrad Świerczek[b], Akito Takasaki[a], Bogdan Dabrowski[c]*

[a] Shibaura Institute of Technology, Department of Engineering Science and Mechanics, 3-7-5 Toyosu, Koto-ku, 135-8548 Tokyo, Japan. [b] AGH University of Science and Technology, Faculty of Energy and Fuels, al. A. Mickiewicza 30, 30-059 Krakow, Poland. [c] Department of Physics, Northern Illinois University, DeKalb, IL 60115, USA

IV-4 – POINT DEFECT CHEMISTRY OF OXIDE MATERIALS

A. Padova Fiere

Room A4

IV-4/1

Chairmen: Vladan Stevanovic, Tanmoy Paul

14:20 IV-4_1/I
Mixed ionic-electronic conducting membranes: fundamentals and challenges

*Henny J. M. Bouwmeester**

Electrochemistry Research group, Membrane Science Technology, MESA+ Institute for Nanotechnology, University of Twente P. O. Box 217, 7500 AE, Enschede, The Netherlands

14:45 IV-4_2/O
Cation and anion diffusion in tantalum oxide

Ute N. Gries[a], Henning Schraknepper[a], Katharina Skaja[b], Felix Gunkel[b], Susanne Hoffmann-Eifert[b], Rainer Waser[b], Roger A.de Souza[a],*

[a] Institute of Physical Chemistry, RWTH Aachen University, Landoltweg 2, 52074 Aachen, Germany. [b] Peter Grünberg Institute (PGI-7), Forschungszentrum Jülich GmbH, 52425 Jülich, Germany.

15:05 IV-4_3/O
Fine-Tuning of Oxygen Vacancy and Interstitial Concentrations by Electrical Bias

Chang Sub Kim, Harry L. Tuller*

Massachusetts Institute of Technology, Department of Materials Science and Engineering, Cambridge, MA 02139, USA

15:25 IV-4_4/O
High-Temperature ^{57}Fe Mössbauer Study of BSCF ($Ba_{0.5}Sr_{0.5}$)($Co_{0.8}Fe_{0.2}$)$O_{3-\delta}$

Piotr Gaczyński[a], Anja Harpf[b], Juergen Boer[b], Robert Kircheisen[b], Ralf Kriegel[b], Klaus-Dieter Becker[a]

[a]Institute of Physical and Theoretical Chemistry, Technische Universität Braunschweig, Hans-Sommer-Straße 10, D-38106 Braunschweig, Germany [b] Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Michael-Faraday-Straße 1, D-07629 Hermsdorf, Germany

15:45 BREAK

IV-4/2

Chairmen: Henny J. M. Bouwmeester, Klaus-Dieter Becker

16:15 IV-4_5/I
Predicting oxygen off-stoichiometry in complex oxides

*Vladan Stevanović[a], [b]**

[a] Colorado School of Mines, Department of Metallurgy and Materials Engineering, 1500 Illinois St., Golden, CO 80401, USA. [b] National Renewable Energy Laboratory, 15013 Denver West Parkway, Golden, CO 80401, USA

16:40 IV-4_6/O
Oxygen-Excess-Type Solid Electrolyte Based on Lanthanum Silicate

Atsushi Mineshige[a], Huaiyang Xiao[a], Hikaru Hayakawa[a], Mio Kobayashi[a], Takuma Nishimoto[a], Akie Hegur[a], Atsushi Saito[a], Tetsuo Yazawa[a] and Hideki Yoshioka[b]*

[a] Graduate School of Engineering, University of Hyogo, Japan. [b] Hyogo Prefectural Institute of Technology, Suma-ku, Kobe, Hyogo 654-0037, Japan

17:00 IV-4_7/O
Electrochemical Impedance Analysis of Er doped $La_2Mo_2O_9$ using Impedance Spectroscopy Genetic Programming

Tanmoy Paul and Yoed Tsur*

Technion-Israel Institute of Technology, Wolfson Department of Chemical Engineering, Haifa 3200003, Israel

17:20 IV-4_8/O
Modelling of solid-state electrolytes for Li-ion batteries.

Pooja M. Panchmatia[a], Matthew A. Howard[b], Paul A. Anderson[b], Peter R. Slater[b]*

[a] Department of Chemistry, Loughborough University, Loughborough LE11 3TU, UK. [b] School of Chemsitry, University of Birmingham, Birmingham B15 2TT, UK

IV-6 SYNCHROTRON AND NEUTRON TECHNIQUES FOR THE STUDY OF ION-CONDUCTING MATERIALS

A. Padova Fiere

Room A6

IV-6/5: **Polymers Structure**

Chairman: Sandrine Lyonnard

9:00 IV-6_17/K
Morphology of PFSA ionomers and thin films

*Ahmet Kusoglu**

Energy Technologies Area, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

9:30 IV-6_18/I
Water distribution and ionomer microstructure in PEMFC using operando X-Ray and Neutron Scattering Techniques

A. Morin[1], G. Gebel[1], S. Lyonnard[1]

[1] CEA/Université Grenoble Alpes, Grenoble F-38000, France

9:55 IV-6_19/I
Elucidation of the morphology of hydrocarbon polymer electrolyte membranes by small-angle neutron scattering technique.

*Aurel Radulescu **

Forschungszentrum Jülich GmbH, Jülich Centre for Neutron Science, 85747 Garching, Germany

10:20 BREAK

IV-6/6: **Polymers Structure**

Chairman: Sandrine Lyonnard

11:00 IV-6_20/I
USAXS Analysis of Morphological Features in Gel-State Functionalized Blocky Ionomers

*Gregory B. Fahs, Samantha J. Talley, Lindsey J. Anderson, Robert B. Moore**

Virginia Tech, Department of Chemistry, Macromolecules Innovation Institute, 800 West Campus Drive, Blacksburg, Virginia 24061

11:25 IV-6_21/I
Investigation of the local structure and the nanomorphology of ionomers by using synchrotron X-ray scattering and spectroscopy.

Giuseppe Portale[a], Klaus-Dieter Kreuer[b], Alessandro Longo[c]*

[a] Zernike Institute for Advanced Materials, University of Groningen, Nijenborgh 4, 9747 AG Groningen, the Netherlands. [b] Max-Planck-Institut für Festkörperforschung, Stuttgart, Germany. [c] Netherlands Organization for Scientific Research, DUBBLE@ESRF, Grenoble, France.

11:50 IV-6_22/O
Structure of Ionic Domains in Nafion Thin Films as a Function of Film Thickness

Joseph A. Dura[a] and Steven C.deCaluwe[b]*

[a] National Institute of Standards and Technology - Center for Neutron Research, 100 Bureau Drive MS6102, Gaithersburg, MD 20899, USA. [b] Colorado School of Mines, Department of Mechanical Engineering, G. Brown Hall, W410 B, Golden, CO 80401 USA.

12:10 LUNCH

IV-6/7: **Oxides Structure**

Chairman: Gerard Gebel

14:20 IV-6_23/I
Lithium Diffusion Study on Cathode $LiFePO_4$ by Neutron Diffraction

Evvy Kartini[a,], Andon Insani[a] and Maykel Manawan[b]*

[a] National Nuclear Energy Agency, Center for Science and Technology for Advanced Materials, South Tangerang 15314, Indonesia. [b] Materials Science, Faculty of Mathematic and Natural Science, University of Indonesia, Indonesia

14:45 IV-6_24/O
Structural features of RE-doped ceria (RE≡Gd, Sm, Lu): the hybrid model studied by synchrotron x-ray diffraction and μ-Raman spectroscopy

C. Artini[a, b], M. Pani[a, c], M. M. Carnasciali[a, d], J. R. Plaisier[e], G. A. Costa[a, c]*

[a] Department of Chemistry and Industrial Chemistry, University of Genova, Genova, Italy. [b] CNR-ICMATE, Genova, Italy. [c] CNR-SPIN, Genova, Italy. [d] INSTM, Genova, Italy. [e] Elettra - Sincrotrone Trieste S. C. p. A., Basovizza, Trieste, Italy

15:05 IV-6_25/O
Chalcogenide glasses in the AgI-HgS-As_2S_3 system: macroscopic, electric, and structural properties

Mohammad Kassem, Sohayb Khaoulani, Eugene Bychkov*

Université du Littoral Cote d'Opale, LPCA, EA CNRS 4493, F-59140 Dunkerque, France

ORAL PRESENTATIONS

WEDNESDAY June 21, 2017

PLENARY

A. Padova Fiere

Room A1

Chairman: John A. Kilner

8:00 P3 – Mogens Mogensen
Reversible Solid Oxide Cells – Fundamentals, Status, Challenges, and Perspectives
*Mogens Bjerg Mogensen**
Department of Energy Conversion and Storage, Technical University of Denmark, DK 4000 Roskilde, Denmark

8:45 BREAK

MACRO AREA 1: IONICS IN ENERGY AND ENVIRONMENT

I-1 – BEYOND LITHIUM BATTERIES: IONIC TRANSPORT IN POST-LI SYSTEMS

B. Fiore di Botta

Room B2

I-1/7

Chairmen: John Muldoon, Federico Bertasi

9:00 I-1_26/I
Lithium/Sulfur Battery - Protection of the Electrodes by Modification of the Electrolyte
D. Golodnitsky[a, b], E. Peled[a], M. Goor[a], R. Blanga[a], I. Schektman[a], T. Mukra[a], Y. Shoval[a], I. Belenkaya[a]
[a] School of Chemistry; [b] Wolfson Applied Materials Research Center, Tel Aviv University, Tel Aviv, 69978.

9:25 I-1_27/O
Structure analyses of Fe-containing Li_2S-based positive electrode material applicable for Li-S batteries
Tomonari Takeuchi[a], Hiroyuki Kageyama[b], Noboru Taguchi[a], Koji Nakanishi[c], Tomoya Kawaguchi[b], Koji Ohara[d], Katsutoshi Fukuda[b], Atsushi Sakuda[a], Toshiaki Ohta[c], Toshiharu Fukunaga[b], Hikari Sakaebe[a], Hironori Kobayashi[a], and Eiichiro Matsubara[b]
[a] National Institute of Advanced Industrial Science and Technology (AIST), Midorigaoka 1-8-31, Ikeda, Osaka 563-8577, Japan. [b] Office of Society-Academia Collaboration for Innovation, Kyoto University, Uji, Kyoto 611-0011, Japan. [c] Ritsumeikan University, Noji-Higashi 1-1-1, Kusatsu, Shiga 525-8577, Japan. [d] The Research & Utilization Division, Japan Synchrotron Radiation Research Institute (JASRI), 1-1-1 Kouto, Sayo, Hyogo 679-5198, Japan.

9:45 I-1_28/O
A Novel Approach to Stabilize Electrode Interfaces in Li-Sulphur Batteries.
Andrea La Monaca, Francesca De Giorgio, Riccardo Gambuzzi, Irene Ruggeri, Andrea Merlettini, Maria Letizia Focarete, Francesca Soavi, Catia Arbizzani
Alma Mater Studiorum, University of Bologna, Dept. of Chemistry "Giacomo Ciamician", via F. Selmi 2, 40126 Bologna, Italy.

10:05 I-1_29/O
Binder-free phenyl sulfonated graphene/sulfur electrodes with excellent cyclability for lithium sulfur batteries
Aishui Yu
Department of Chemistry, Shanghai Key Laboratory of Molecular Catalysis and Innovative Materials, Institute of New Energy, Fudan University, Shanghai 200438, China.

10:25 I-1_30/O
Formate ion doped PANi wrapped Ketjen Black Carbon/Sulphur composites for Li-S batteries
Usman Zubair, Sebastiano Basso, Julia Amici, Carlotta Francia, Silvia Bodoardo and Nerino Penazzi
Politecnico di Torino, Department of Applied Science and Technology (DISAT), C.so Duca degli Abruzzi 24 - 10129 Torino – (ITALY).

10:45 BREAK

I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS

B. Fiore di Botta

Room B7

I-2/12

Chairmen: Clare Grey, Stefano Passerini

9:00 I-2_48/I
Potassium intercalation for graphite and K_xCoO_2
Shinichi Komaba[a, b], Kei Kubota[a, b], and Mouad Dahbi[a, b]
[a] Tokyo University of Science, Shinjuku, Tokyo 162-8601, Japan. [b] ESICB, Kyoto University, 1–30 Goryo-Ohara, Nishikyo, Kyoto 615-8245, Japan.

9:25 I-2_49/O
N-substituted polyanionic compounds as new high energy-density electrode materials for Li-ion and Na-ion batteries
Marine Reynaud, Montserrat Galceran, Agnieszka Wizner, Laura Loaiza, Teófilo Rojo, Michel Armand, Montse Casas-Cabanas
CIC energiGUNE, Parque Tecnológico de Álava, C/ Albert Einstein 48, 01510 Miñano (Vitoria-Gasteiz, Álava), Spain.

9:45 I-2_50/O
Olivine-type Cathode Materials for Li^+, Na^+ and Mg^{2+} Batteries: Strain Effects and Ionic Transport
Jennifer Heath[a], Cristina Tealdi[b], Hungru Chen[a], M. Saiful Islam[a]
[a] Department of Chemistry, University of Bath, Bath, United Kingdom, BA1 7AY. [b] Department of Chemistry, University of Pavia and INSTM, Viale Taramelli 16, 27100 Pavia, Italy.

10:05 I-2_51/O
Structural and transport properties of $Na_3V_2(PO_4)_2F_{3-y}O_y$ ($0 \le y \le 0.5$) as a function of the oxygen content and of the temperature
Benoit Fleutot[a,c], Thibault Broux[a,b,c], Rénald David[a,c], Annelise Brüll[b], Philippe Veber[b], François Fauth[d], Laurence Croguennec[b,c] and Christian Masquelier[a,c]
[a] LRCS, Université de Picardie Jules Verne, CNRS UMR 7314, 33 Rue Saint Leu, Amiens, France. [b] CNRS, Université de Bordeaux, Bordeaux INP, ICMCB UPR 9048, 33600 Pessac, France. [c] RS2E, Réseau Français sur le Stockage Electrochimique de l'Energie, Amiens, France. [d] CELLS - ALBA synchrotron, Cerdanyola del Valles, E-08290 Barcelona, Spain.

10:25 I-2_52/O
Electrochemical Performance Improvement of $Na_3V_2(PO_4)_3$ Positive Electrodes through V-Site Substitution: A Combined Theoretical and Experimental Study
Lina Zhao[a], Hailei Zhao[a,b], Zhihong Du[a], Zijia Zhang[a], Zhaolin Li[a]
[a] University of Science and Technology Beijing, School of Materials Science and Engineering, Beijing 100083, China. [b] Beijing Municipal Key Laboratory of New Energy Materials and Technologies, Beijing 100083, China.

10:45 BREAK

I-2/13

Chairmen: Shinichi Komaba, Stefano Passerini

11:00 I-2_53/O
Electronic Structure „Engineering" as a New Tool in the Development of Materials for Li-ion and Na-ion Batteries
Janina Molenda
AGH University of Science and Technology, Faculty of Energy and Fuels, Departament of Hydrogen Energy, al. Mickiewicza 30, 30-059 Krakow, Poland.

11:20 I-2_54/O
Advanced Sodium-ion Batteries Based on NASICON-type Materials
Yan Yu[a, b], Joachim Maier[b]
[a] Department of Materials Science and Engineering, University of Science and Technology of China, 230026, Hefei, Anhui, P. R. China. [b] Max Planck Institute for Solid State Research, Heisenbergstr. 1, Stuttgart, 70569, Germany.

11:40 I-2_55/O
Aqueous Processing of $Na_{0.44}MnO_2$ Cathode Material for the Development of Greener Na-Ion Batteries
Valentina Dall'Asta[a], Daniel Buchholz[b, c], Luciana Gomez Chagas[b,c], Eliana Quartarone[a], Cristina Tealdi[a], Chiara Ferrara[a], Piercarlo Mustarelli[a], Stefano Passerini[b, c]
[a] University of Pavia, Dept. of Chemistry and INSTM, Via Taramelli 12, 27100 Pavia, Italy. [b] Helmholtz Institute Ulm (HIU), Helmholtzstraße 11, 89081 Ulm, Germany. [c] Karlsruhe Institute of Technology (KIT), P.O. Box 3640, 76021 Karlsruhe, Germany.

12:00 I-2_56/O
Water-Processable Binder: A Key Feature to Develop Low-Cost, Eco-Friendly and High-Performing Lithium-Ion Batteries
Francesca De Giorgio, Andrea La Monaca, Francesca Soavi, Catia Arbizzani
Alma Mater Studiorum University of Bologna, Department of Chemistry "Giacomo Ciamician", Via Selmi 2, 40126 Bologna, Italy.

12:20 I-2_57/O
Relationship between the cyclability and charge-transfer effect in cathode materials studied by soft X-ray emission spectroscopy
Daisuke Asakura, Yusuke Nanba, Yuki Makinose, Hirofumi Matsuda, and Eiji Hosono
Research Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology (AIST), 1-1-1 Umezono, Tsukuba, Ibaraki 305-8568, Japan.

12:40 LUNCH

I-3 – ALL SOLID-STATE BATTERIES

B. Fiore di Botta

Room B1

I-3/13: **BATTERY SESSION 5**

Chairmen: Ellen Ivers-Tiffée, Andreas Nenning

9:00 I-3_56/K
Designing All-Solid-State-Batteries: a Model Approach
Ellen Ivers-Tiffée, Philipp Braun
Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), D-76131 Karlsruhe, Germany.

9:30 I-3_57/O
Atomic layer deposition of functional films for all-solid-state lithium-ion microbatteries
Sabine Zybell[a], Sascha Bönhardt[a], Alireza M. Kia[a], Wenke Weinreich[a], Romy Liske[a], Keerthi Dorai Swamy Reddy[a, b], Christoph Hoßbach[b], Volker Neumann[b]
[a] Fraunhofer Institute for Photonic Microsystems IPMS, Center Nanoelectronic Technologies (CNT), Königsbrücker Str. 178, 01099 Dresden, Germany. [b] Technical University Dresden, Institute of Semiconductors and Microsystems, 01062 Dresden, Germany.

9:50 I-3_58/O
Advanced Impedance Analysis for Solid-State Thin Film Batteries
Philipp Braun, Christopher Wurst, André Weber, Ellen Ivers-Tiffée
Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), D-76131 Karlsruhe, Germany.

10:10 I-3_59/O
Lithium Diffusion Coefficient of Thin-Film Lithium Battery Materials Measured by Secondary Ion Mass Spectrometry
Naoaki Kuwata[a], Xiaoli Lu[a], Masakatsu Nakane[a], Gen Hasegawa[a], Daiki Maeda[a], Takamichi Miyazaki[b], Junichi Kawamura[a]
[a] Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 2-1-1 Katahira, Sendai, 980-8577 Japan. [b] School of Engineering, Tohoku University, Sendai 980-8579 Japan.

10:30 I-3_60/O
Pressure Dependent Conductivity for Lithium Containing Ceramics: Lithium Aluminum Titanium Phosphate (LATP), Lithium Lanthanum Tantalum Oxide (LLTO), Lithium Lanthanum Titanate (LLT), Lithium Aluminum Germanium Phosphate (LAGP), and Lithium Lanthanum Zirconium Oxide (LLZO)
John W. Ostrander, Carolyn Torres, Dale Teeters
The University of Tulsa, Department of Chemistry and Biochemistry, 800 S. Tucker Dr., Tulsa, OK 74104 USA.

10:50 BREAK

I-3/14: **Li-ELECTROLYTES**

Chairmen: Ellen Ivers Tiffée, Andreas Nenning

11:00 I-3_61/I
"On the structural chemistry of thiophosphates and the mechano-chemical influences in solid-state batteries"
Wolfgang Zeier
Institute of Physical Chemistry, Justus-Liebig-University Giessen, Germany.

11:25 I-3_62/O
Defect chemistry and lithium transport in Li_3OCl anti-perovskite superionic conductors
Ziheng Lu and Francesco Ciucci
The Hong Kong University of Science and Technology, Mechanical and Aerospace Engineering, Clearwater Bay, Kowloon, Hong Kong, China SAR.

11:45 I-3_63/O
Lithium Diffusion in Complex Phosphidosilicate Materials
Stephen R. Yeandel[a], David O. Scanlon[b], Pooja M. Panchmatia[a]
[a] Loughborough University, Department of Chemistry, Epinal Way, Loughborough, Leicestershire, LE11 3TU, UK. [b] University College London, Department of Chemistry, 20 Gordon Street, London, WC1H 0AJ, UK.

12:05 I-3_64/O
Recent advances in development of all solid state lithium ion batteries with inorganic solid electrolytes
Gunars Bajars, Karina Bikova, Gints Kucinskis, Janis Kleperis
Institute of Solid State Physics, University of Latvia, 8 Kengaraga street, Riga, LV-1063, Latvia.

12:25 I-3_65/O
Lithium-Stuffed Garnet-Type Oxide $Li_{6.4}La_3Zr_2O_{12}$ for Solid-State Lithium Batteries: Computational and Experimental Studies
Mattia Saccoccio[a], Francesco Ciucci[a,b]
[a] The Hong Kong University of Science and Technology, Mechanical and Aerospace Engineering, Clearwater Bay, Kowloon, Hong Kong, China SAR. [b] The Hong Kong University of Science and Technology, Chemical and Biomolecular Engineering, Clearwater Bay, Kowloon, Hong Kong, China SAR.

12:45 LUNCH

I-5 – POLYMER ELECTROLYTE IONOMERS: ADVANCES IN CATION- AND ANION-EXCHANGE MEMBRANES AND ION CONDUCTION

B. Fiore di Botta

Room B9

I-5/1

Chairman: Andrew M. Herring

9:00 I-5_1/I
Progress in materials development for proton- and anion-exchange membranes
Michael D. Guiver[a], Young Moo Lee[b]*
[a] Tianjin University, State Key Laboratory of Engines, Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), Nankai District, Tianjin 300072, P.R. China. [b] Hanyang University, Department of Energy Engineering, Seoul 133-791, Republic of Korea

9:25 I-5_2/I
Cation- and anion-conducting aromatic ionomers for electrochemical energy technologies
*Philippe Knauth [a,c] * and Maria Luisa Di Vona [b,c]*
[a] Aix Marseille University (AMU), CNRS, UMR 7246 Madirel, 13397 Marseille, France. [b] University Rome Tor Vergata (URoma2), Dep Industrial Engineering, 00133 Roma, Italy. [c] International Associated Laboratory "Ionomer Materials for Energy" (AMU, URoma2, CNRS)

9:50 I-5_3/O
Anion-conducting polymers and membranes functionalised with cyclo-aliphatic quaternary ammonium cations
*Hai-Son Dang, Joel S. Olsson, Thanh Huong Pham, Patric Jannasch**
Department of Chemistry, Lund University, P.O. Box 124, SE-22100 Lund, Sweden

10:10 I-5_4/O
Conductivity and Relaxation Phenomena in Proton and Anion Exchange Membranes by Broadband Electric Spectroscopy
Keti Vezzù[1,2], Enrico Negro[1,3], Federico Bertasi[1], Graeme Nawn[1], Gioele Pagot[1,3], Angeloclaudio Nale[1], Yannick Herve Bang[1], Giuseppe Pace [4], Vito Di Noto[1,2,]*
[1] Section of Chemistry for Technology, Department of Industrial Engineering, University of Padova, Via Marzolo 9, 35131 Padova, Italy. [2] INSTM, Via Marzolo 1, 35131 Padova, Italy. [3] Centro Studi di economia e tecnica dell'energia "Giorgio Levi Cases", Via Marzolo 9, 35131 Padua, Italy. [4] CNR-ICMATE, Via Marzolo 1, 35131 Padova, Italy

10:30 BREAK

I-5/2

Chairman: Patric Jannasch

11:00 I-5_5/I
Development and Implementation of Perfluoro Anion Exchange Membranes (PF AEMs)
Bryan Pivovar
National Renewable Energy Lab, Chemistry and Nanoscience Center, 15013 Denver West Parkway, Golden, CO, 80002, USA

11:25 I-5_6/O
Understanding the effect of CO_2 on material and morphological properties of OH^- form of AEM
Ashutosh G. Divekar[a], Andrew M. Herring[a],Bryan S. Pivovar[b],Andrew M. Park[b], Zbyslaw R. Owczarczyk[b], Julia Ponce-González[c],John R. Varcoe[c],Soenke Seifert[d]*
[a] Colorado School of Mines, Department of Chemical and Biological Engineering, 1500 Illinois St, Golden, CO 80401, USA. [b] National Renewable Energy Laboratory, Hydrogen & Fuel cell research, 15013 Denver W Pkwy, Golden, CO 80401,USA. [c] University of Surrey-Guildford, Department of Chemistry, Senate House, Stag Hill Campus, Guildford GU2 7XH, UK. [d] Argonne National Laboratory, X-ray Sciences Division, Advanced Photon Source, Lemont, IL 60439, USA.

11:45 I-5_7/O
Thin Robust Anion Exchange Membranes with C6 Nitrogen Heterocyclic Stable Cations
Andrew M. Herring[a], Ye Liu[a], Tara P. Pandey[a], Himanshu N. Sarode[a], Mei-Chen Kuo[a], Wenxu Zhang[b], and E. Bryan Coughlin[b].*
[a] Colorado School of Mines, Department of Chemical and Biological Engineering, Golden, CO 80401, USA. [b] University of Massachusetts, Department of Polymer Science and Engineering, Amherst, MA 01003, USA

12:05 I-5_8/O
New ion-exchange membranes derived from polyketone
Graeme Nawn[a,b], Keti Vezzù[a], Gianni Cavinato[c], Giuseppe Pace[d], Vito Di Noto[a,b,c]*
(a) Section of Chemistry for Technology, Department of Industrial Engineering, University of Padova, Via Marzolo 1, I-35131 Padova, Italy. [b] Centre for Mechanics of Biological Materials, Via Marzolo 9, I-35131 Padova, Italy. [c] Department of Chemical Sciences, University of Padova, Via Marzolo 1, I35131 Padova (PD), Italy. [d] Istituto di Chimica della Materia Condensata e di Tecnologie per l'Energia (CNR-ICMATE), Via Marzolo 1, I35131 Padova (PD), Italy

12:25 LUNCH

I-8 : CERAMIC PROTON AND HYDRIDE ION CONDUCTORS

A. Padova Fiere

Room A3

I-8/9

Chairman: Donglin Han

9:00 I-8_38/I
Hydration of $BaCe_xZr_{0.9-x}Y_{0.1}O_{3-d}$ (x=0-0.2) proton conductors: from fundamental studies to practical applications
Sandrine Ricote [a], Angelique Jarry [b], Grant Hudish [c], W. G. Coors [d]*
(a) Colorado School of Mines, Mechanical Engineering Department, 1500 Illinois Street, CO80401 Golden, USA. (b) University of Maryland, Department of Chemistry & Biochemistry, MD20742 College Park, USA. (c) CoorstTek Inc., 900 6th Street, CO80401 Golden, USA. (d) Hydrogen Helix, CO80401 Golden, USA

9:25 I-8_39/O
Influence of Incorporation and Exclusion of Ni on Electrical and Structural Properties of Y-Doped $BaZrO_3$
Donglin Han [a]*, Kozo Shinoda [b], Junji Iihara [c], Shigeaki Uemura [c], Kenji Kazumi [a], Susumu Tsukimoto [d], Chihiro Hiraiwa [c], Masatoshi Majima [c], Tetsuya Uda [a]
[a] Department of Materials Science and Engineering, Kyoto University, Yoshida Honmachi, Sakyo-ku, Kyoto 606-8501, Japan. [b] Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Katahira 2-1-1, Aoba-ku, Sendai 980-8577, Japan. [c] Sumitomo Electric Industries, Ltd., 1-1-1, Koyakita, Itami-shi, Hyogo 664-0016, Japan. [d] Advanced Institute for Materials Research, Tohoku University, Katahira 2-1-1, Aoba-ku, Sendai 980-8577, Japan

9:45 I-8_40/O
Protonic defects in a layered perovskite $Sr_3Fe_2O_5Cl_2$ and its ionic conductivities
Yutaro Yagi , Isao Kagomiya *, Ken-ichi Kakimoto
Nagoya Institute of Technology, Life Science and Applied Chemistry, 466-8555, Japan.

10:05 I-8_41/O
Effect of adding Ni on defect structure and proton transport properties of indium doped barium zirconate
Yuji Okuyama [a], Yoshiki Niina [b], Mizuki Shudo [b], Go Sakai [b], Naoki Matsunaga [b], Kosuke Yamauchi [c], Yuichi Mikami [c], Tomohiro Kuroha [c]*
[a] Organization for Promotion of Tenure Track, University of Miyazaki, 1-1 Gakuenkibanadai-nishi, Miyazaki 889-2192, Japan. [b] Department of Environmental Robotics, Faculty of Engineering, University of Miyazaki, 1-1 Gakuenkibanadai-nishi, Miyazaki 889-2192, Japan. [c] Advanced Research Division, Panasonic Corp., 3-1-1, Yagumo-naka-machi, Moriguchi, Osaka, 570-8501, Japan

10:25 I-8_42/O
Thermodynamics of Reduction of Protonic Conductors Based on Doped $BaZrO_3$
Dmitry Tsvetkov, Ivan Ivanov, Nikita Shevyrev, Andrey Zuev*
Ural Federal University, Department of Physical and Inorganic Chemistry, Lenin Av. 51, 620000, Ekaterinburg, Russia

10:45 BREAK

I-8/10

Chairmen: Yoshihiro Yamazaki, Maria Gomez

11:00 I-8_43/I
The effect of acceptor dopant and oxygen vacancies on proton conduction pathways in barium zirconate
Maria Alexandra Gomez, Alice VanBokkelen*
Mount Holyoke College, Department of Chemistry, 50 College Street, South Hadley, MA 01075, USA

11:25 I-8_44/O
Characterisation of cation ordering, oxygen vacancy distribution and proton site in hexagonal and cubic $BaTi_{1-x}Sc_xO_{3-\delta}$
Nico Torino [a], Paul F. Henry [b], Seikh M. H. Rahman [a], Christopher S. Knee [a], Sten G. Eriksson [a], S. T. Norberg [a], Tor S. Bjørheim [c], Reidar Haugsrud [c], Samantha Callear [b], Ronald Smith [b]*
[a]Chalmers University of Technology, Department of Chemistry and Chemical Engineering, Kemigården 4, SE-41296 Gothernburg, Sweden. [b]ISIS Neutron and Muon Source, Rutherford Appleton Laboratory, Didcot OX11 0QX, UK. [c]Univeristy of Oslo, Centre for Materials Science and Nanotechnology, FERMiO, Gaustadallén 21, NO-0349 Oslo, Norway [c] University of Surrey-Guildford, Department of Chemistry, Senate House, Stag Hill Campus, Guildford GU2 7XH, UK. [d] Argonne National Laboratory, X-ray Sciences Division, Advanced Photon Source, Lemont, IL 60439, USA.

11:45 I-8_45/O
Proton dynamics in brownmillerite-based $Ba_2In_2O_5(H_2O)_x$
Adrien Perrichon [a], Mónica Jiménez-Ruiz [b], Michael M. Koza [b], Seikh M. H. Rahman [c], Sten Eriksson [c], Maths Karlsson [a]*
[a] Chalmers University of Technology, Department of Physics, Göteborg, Sweden. [b] Institut Laue-Langevin, 6 rue Jules-Horowitz, Grenoble, France. [c]Chalmers University of Technology, Department of Chemistry, Göteborg, Sweden

12:05 I-8_46/O (Cancelled))
Structural and transport properties of novel proton-conducting materials $Nd_{1-x}Ln_xBaInO_4$ (Ln = Sm, Pr)
Mateusz Tarach [a, b], Łukasz Kondracki [a], María Balaguer [b], José M. Serra [b], Konrad Świerczek [a]*
[a] AGH University of Science and Technology, Faculty of Energy and Fuels,
al. A. Mickiewicza 30, 30-059 Krakow, Poland. [b] Instituto de Tecnología Química (Universidad Politécnica de Valencia - Consejo Superior de Investigaciones Científicas), Av. Naranjos s/n, E-46022 Valencia, Spain.

12:25 I-8_47/O
Lattice strain effects on doping, hydration and proton transport in scheelite-type electrolytes for solid oxide fuel cells
Chiara Ferrara [a], Chris Eames [b], M. Saiful Islam [b], Cristina Tealdi [a]*
[a] University of Pavia, Department of Chemistry, Viale Taramelli 16, 27100 Pavia, Italy. [b] University of Bath, Department of Chemistry, BA2 7AY Bath, UK

12:45 LUNCH

I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS

A. Padova Fiere

Room A2

I-9/12: **SOEC - Proton Ceramic Electrolyzers**

Chairman: Rotraut Merkle

9:00 I-9_57/O
Proton Ceramic Electrolysers; operation, challenges and developments
Ragnar Strandbakke, Einar Vøllestad, Truls Norby.
Department of Chemistry, University of Oslo, FERMiO, Gaustadalléen 21, NO-0349 Oslo, Norway.

9:20 I-9_58/O
Tubular Proton Ceramic Electrolysers for Production of Dry Pressurized Hydrogen
Einar Vøllestad [a], Ragnar Strandbakke[a], Dustin Beaff[b] and Truls Norby[a]*
[a] University of Oslo, Department of Chemistry, Gaustadalléen 21, NO-0349 Oslo, Norway. [b] CoorsTek Membrane Sciences, Gaustadalléen 21, NO-0349 Oslo, Norway
.
9:40 I-9_59/O
Investigations on Electrode Performance of a Proton-Conducting Electrolysis Cell with a Novel Air Electrode $Sr_{2.8}La_{0.2}Fe_2O_{7-\delta}$
Daoming Huan[a], Zhiquan Wang[a], Changrong Xia[a], Ranran Peng[a],Yalin Lu[a]*
[a] CAS Key Laboratory of Materials for Energy Conversion, Department of Materials Science and Engineering, University of Science and Technology of China, Hefei, 230026 Anhui, China

10:00 I-9_60/O
Novel Stable and Efficient Air Electrode Material for Proton-Conducting Reversible Solid Oxide Cells
Ranran Peng, Daoming Huan, Nai Shi, Changrong Xia, Yalin Lu*
CAS Key Laboratory of Materials for Energy Conversion, Department of Materials Science and Engineering, University of Science and Technology of China, Hefei, 230026 Anhui, China

10:20 I-9_61/O
Reaction Kinetics of Electrochemical Synthesis of Ammonia in Proton Conducting Solid Oxide Fuel Cells
Fumihiko Kosaka, Takehisa Nakamura, Akio Oikawa and Junichiro Otomo*
Department of Environment Systems, Graduate School of Frontier Sciences,
The University of Tokyo, 5-1-5 Kashiwanoha,s Kashiwa, Chiba 277-8563, Japan

10:40 BREAK

I-9/13: **SOFC Cathodes V - Stability Issues**

Chairman: Edith Bucher

11:00 I-9_62/O
Determining the effect of atmospheric components on the interaction of gaseous molecular species with oxide air electrodes
*Vincent Thoréton[a], John Druce[a], Helena Téllez Lozano[a], Tatsumi Ishihara[a], John Kilner[a,b]**
[a] WPI-International Institute for Carbon-Neutral Energy Research (I²CNER), Fukuoka, Japan. [b] Department of Materials, Imperial College London, London, UK.

11:20 I-9_63/O
Electrochemical Performance, Oxygen Permeation, and Stability of BSCF:X (X = Y, Ti, or Nb)
L.-S. Unger[a], F. Sigloch[a], V. Wilde[b], S. Baumann[c], M. Meffert[b], C. Niedrig[a], W. Menesklou[a], H. Störmer[b], S. F. Wagner[a], D. Gerthsen[b], E. Ivers-Tiffée[a]*
[a] Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), 76131 Karlsruhe/Germany. [b] Laboratory for Electron Microscopy (LEM), Karlsruhe Institute of Technology (KIT), 76131 Karlsruhe/Germany. [c] Institute of Energy and Climate Research IEK-1 Materials Synthesis and Processing, Forschungszentrum Jülich GmbH, 52425 Jülich/Germany

11:40 I-9_64/O
Enhanced stability of doped $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$ in O_2 and CO_2 containing atmospheres
Laura Almar[a], Heike Störmer[b], Julian Szász[a], Florian Wankmüller[a], André Weber[a], Dagmar Gerthsen[b] and Ellen Ivers-Tiffée[a]*
[a] Institute for Applied Materials (IAM-WET), Karlsruhe Institute of technology (KIT), Adenauerring 20b, D-76131, Karlsruhe, Germany. [b] Laboratory for Electron Microscopy (LEM), Karlsruhe Institute of Technology (KIT), Engesserstr. 7, D-76131 Karlsruhe, Germany.

12:00 I-9_65/O
Influence of Y-doping on long-term stability and oxygen transport of $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$
Rian Ruhl[a], Lana-Simone Unger[b], Christian Niedrig[b], Wolfgang Menesklou[b], Stefan F. Wagner[b], Ellen Ivers-Tiffée[b], Henny J. M. Bouwmeester[a]*
[a]Electrochemistry Research Group, Membrane Science and Technology, Faculty of Science and Technology, MESA+ Institute for Nanotechnology, University of Twente, 7500AE Enschede, Netherlands. [b]Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), 76131 Karlsruhe, Germany

12:20 I-9_66/O
Influence of Cr- and Si-poisoning on the oxygen exchange kinetics of $La_{0.6}Sr_{0.4}CoO_{3-\delta}$ and $La_2NiO_{4+\delta}$
Werner Sitte, Edith Bucher, Nina Schrödl, Andreas Egger*
Montanuniversitaet Leoben, Chair of Physical Chemistry, Franz-Josef-Straße 18, Leoben, Austria

12:40 LUNCH

I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS

B. Fiore di Botta

Room B6

I-10/9

Chairman: Alberto Gasparotto

9:00 I-10_36/I
Solar driven water treatment using TiO_2-based composites
*Hrvoje Kušić**
Faculty of Chemical Engineering and Technology, University of Zagreb, Croatia

9:25 I-10_37/O
Titania-Silica based nanostructured films for Photocatalysis in solid, aqueous and gaseous phase
Urška Lavrenčič Štangar[a,b], Andraž Šuligoj[c], Nives Vodišek[b], Olena Pliekhova[b], Nataša Novak Tušar[c,b]*
[a] University of Ljubljana, Faculty of Chemistry and Chemical Technology, Večna pot 113, 1000 Ljubljana, Slovenia. [b] University of Nova Gorica, Laboratory for Environmental Research, Vipavska 13, 5000 Nova Gorica, Slovenia.
[c] National Institute of Chemistry, Laboratory for Inorganic Chemistry and Technology, Hajdrihova 19, 1000 Ljubljana, Slovenia.

9:45 I-10_38/O
Mesoporous and visible light active TiO_2: a selective De-NO_x photocatalyst
*José Balbuena[a], José M. Calatayud [b], Manuel Cruz-Yusta [a], Pablo Pardo[b], Francisco Martín[c], Javier Alarcón[b] and Luis Sánchez[a]**
[a] University of Córdoba, Inorganic Chemistry Department, Campus de Rabanales, Córdoba, 14071, Spain. [b] University of Valencia, Inorganic Chemistry Department, C/ Dr. Moliner 50, Burjasot (Valencia), 46100, Spain. [c] University of Málaga, Chemical Engineering Department, Campus de Teatinos, Málaga, 29071, Spain

10:05 I-10_39/O
Metal/oxide and oxide/oxide heterojunctions as photocatalysts for CO_2 reduction
Fernando Fresno, Patricia Reñones, Sandra Galdón, Mariam Baravi, Marta Liras, Víctor A. de la Peña O'Shea.*
Photoactivated Processes Unit, IMDEA Energy Institute, Avda. Ramón de la Sagra 3, Móstoles (Madrid), Spain.

10:25 I-10_40/O
Organic Dyes on Wurtzite Surface – Effects of Orientation on the Photoinduced Charge Transfer
Viacheslav Golovanov[a], Viktoria Golovanova[a], Nikolai V. Tkachenko [b]*
[a] South–Ukrainian University, Staroportofrankovskaya str. 26, 65020, Odessa, Ukraine. [b] Laboratory of Chemistry and Bioengineering, Tamepre University of Technology, P. O. Box 541, FI-33101 Tampere, Finland

10:45 BREAK

I-10/10

Chairman: Luis Sanchez

11:00 I-10_41/I
Ab initio modeling of metal oxides: Bulk, interface and surface properties
Leonhard Mayrhofer[a,b], Alexander Held[a,b], Michael Walter[a,b], Michael Moseler[a,b]
a) Fraunhofer IWM, Wöhlerstr. 11, 79108 Freiburg, Germany. b) University of Freiburg, Freiburg Materials Research Center FMF, Stefan-Meier-Str. 21, 79104 Freiburg

11:25 I-10_42/O
Fe_2O_3-TiO_2-Au nanocomposites: from design to solar hydrogen production
Giorgio Carraro[a], Alberto Gasparotto[a], Chiara Maccato[a], Michael E. A. Warwick[a], Davide Barreca[b], Valentina Gombac[c], Paolo Fornasiero[c], Stuart Turner[d], Gustaaf Van Tendeloo[d]*
[a] Department of Chemistry, Padova University and INSTM, Via F. Marzolo, 1 – 35131 Padova, Italy. [b] CNR-ICMATE and INSTM, Department of Chemistry, Padova University, Via F. Marzolo, 1 – 35131 Padova, Italy. [c] Department of Chemical and Pharmaceutical Sciences, ICCOM-CNR Trieste Research Unit - INSTM Research Unit - Trieste University, via L. Giorgieri, 1 - 34127 Trieste, Italy. [d] EMAT, Antwerp University, Groenenborgerlaan 171 - B-2020 Antwerpen, Belgium.

11:45 I-10_43/O
Tailoring the Deposition of Photoactive TiO_2/Metallic Foams by ALD for Alcohol Photo-Reforming in Gas Phase
S. Murcia-López[a], M. Biset-Peiró[a], J.R. Morante[a][b], T. Andreu[a][c]*
[a] Catalonia Institute for Energy Research (IREC), Advanced Materials for Energy, Jardins de les Dones de Negre 1 08930 Sant Adrià de Besós, Spain. [b] University of Barcelona (UB), Department of Electronics, Martí i Franquès 1 08028 Barcelona, Spain. [c] University of Barcelona (UB), Department of Materials Science and Physical Chemistry, Martí i Franquès 1 08028 Barcelona, Spain.

12:05 I-10_44/O
ZnO Based Electrospun Mats as Multifunctional Membranes for Water Treatment and Sustainable Hydrogen Generation
Maria Elena Fragalà, [a] Giulia Ognibene,[b], Marcello Condorelli, [a],Roberto Fiorenza, [a] Gianluca Cicala, [b] Salvatore Scirè, [a] Giuseppe Compagnini[a]*
[a] Dipartimento di Scienze Chimiche and INSTM, Università di Catania Viale Andrea Doria 6, 95100 Catania (Italy). [b] DICAR, Università di Catania Viale Andrea Doria 6, 95100 Catania (Italy)

12:25 LUNCH

I-11 – FUNCTIONAL METAL OXIDE INTERFACES IN EFFICIENT ELECTROCHEMICAL ENERGY CONVERSION, BIOMASS CONVERSION AND CHARGE STORAGE SYSTEMS

B. Fiore di Botta

Room B4

I-11/2

Chairmen: Sebastian Fiechter, Csaba Janaky

9:00 I-11_6/I
Operando studies of working catalysts by synchrotron-based XPS and XAS at atmospheric pressure
Günther Rupprechter
Institute of Materials Chemistry, Technische Universität Wien, 1060 Vienna, Austria

9:25 I-11_7/I
Intrinsic and extrinsic redox processes in euhedral cobalt spinel nanocrystals - experimental and computational investigations
*Filip Zasada, Joanna Gryboś , Witold Piskorz, Zbigniew Sojka**
Faculty of Chemistry, Jagiellonian University, Ingardena 3, 30-060 Krakow, Poland

9:50 I-11_8/I
Highly Acidic Mixed-Metal-Oxide Catalytic Matrices for Dispersed Noble Metal Nanoparticles: Enhancement of Electrooxidation of Simple Organic Fuels
Iwona A. Rutkowska, Pawel J. Kulesza*
Faculty of Chemistry, University of Warsaw, Pasteura 1, 02-093 Warsaw, Poland.

10:15 I-11_9/O
Design of Metal Oxide Anode Materials for Lithium-Ion Batteries
*Alessandro Palmieri, Benjamin Ng, William E. Mustain**
University of Connecticut, Department of Chemical & Biomolecular Engineering, 191 Auditorium Road, Unit 3222; Storrs, CT 06269, USA
University of Connecticut, Center for Clean Energy Engineering, 44 Weaver Road; Storrs, CT 06269, USA

10:35 BREAK

I-11/3

Chairmen: Ruhlmann Laurent, Zbigniew Sojka

11:00 I-11_10/I
Perovskite Oxide OER Catalyst for Alkaline Water Electrolyzer
*Hoon T. Chung and Piotr Zelenay**
Materials Physics and Application Division, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA.

11:25 I-11_11/I
On the Stability of PEMFC Cathodes Based on 1D Metal Oxide Electrocatalyst Supports
Sara Cavaliere [a], Ignacio Jiménez-Morales [a], Mario A. Alpuche-Aviles [b], Deborah Jones [a], Jacques Rozière [a]*
[a] Institut Charles Gerhardt, UMR CNRS 5253, Agrégats Interfaces et Matériaux pour l'Energie, Université de Montpellier, 34095 Montpellier Cedex 5, France. [b] Department of Chemistry, University of Nevada, Reno, Nevada, 89557, USA

11:50 I-11_12/I
On the role of electrocatalysts in the process of light-driven water splitting
Sebastian Fiechter, Fanxing Xi, Farabi Bozheyev, Moritz Kölbach, Sean Berglund, Fatwa Abdi, Peter Bogdanoff, Klaus Ellmer, Roel van de Krol
Helmholtz-Zentrum für Materialien und Energie GmbH, Institute for Solar Fuels, Hahn-Meitner-Platz 1, 14109 Berlin, Germany

12:15 I-11_13/O
In situ growth of Pt_3Ni nanoparticles on A-site deficient perovskite with enhanced activity for oxygen reduction reaction
*Yang Gao and Francesco Ciucci**
The Hong Kong University of Science and Technology, Mechanical and Aerospace Engineering, Clearwater Bay, Kowloon, Hong Kong, China SAR

12:35 LUNCH

I-12 – DEFECT CHEMISTRY, TRANSPORT AND REACTIVITY AT GAS/ELECTRODE INTERFACES

B. Fiore di Botta

Room B10

I-12/9

Chairman: David Mueller

9:00 I-12_36/I
Influence of Polarization on SOFC Cathode Degradation Investigated by Using Patterned Thin Film Model Electrodes
K. Amezawa, Y. Shindo, Y. Fujimaki, Y. Kimura, T. Nakamura, K. Yashiro, F. Iguchi, H. Yugami, T. Kawada*
Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai 980-8577, Japan

9:25 I-12_37/O
Surface exchange of LSCF measured in ambient air using back-exchange
Samuel J. Cooper [a], Mathew Niania [b], Nigel Brandon [a], John A. Kilner [b]*
[a] Earth Science and Engineering, Imperial College London, London SW7 2BP. [b] Department of Materials, Imperial College London, London SW7 2BP

9:45 I-12_38/O
Imaging Technique of Ionic Diffusion in LSM-based Composite Cathode of Solid Oxide Fuel Cell
Tsuyoshi Nagasawa [a], Katsunori Hanamura [b]*
[a] Tokyo Institute of Technology, Department of Mechanical and Control Engineering, 2-12-1 O-okayama, Meguro-ku, Tokyo 152-8550, Japan. [b] Tokyo Institute of Technology, School of Engineering, Department of Mechanical Engineering, Japan

10:05 I-12_39/O
Quantitative analysis of oxygen diffusion and surface exchange coefficients of grain and grain boundaries in polarized LSM thin film electrodes
Tobias M. Huber [a, b, c], Giuseppe Brunello [d, e], Grigorios Panagakos [d, e], Edvinas Navickas [a], Herbert Hutter [a], Kazunari Sasaki [c, e], Harry Tuller [e, f], David Mebane [d, g], Jürgen Fleig [a]
[a] TU Wien, Chem. Tech. and Anal. Getreidemarkt 9/CTA164-EC 1060 Vienna, AUT. [b] Huber Scientific, Rottmayrgasse 17/29 1120 Vienna, AUT. [c] Next-Gen. Fuel Cell Res. Center, 744 Motooka Nishi-ku Fukuoka 819-0395, JAP. [d]U.S. DOE NETL, Cochrans Mill Road, Pittsburgh, PA 15236, USA. 4 Mech. & Aerosp. Eng, West Virginia Univ. Engineering Sciences Morgantown WV 26506, USA. [e] I²CNER, 744 Motooka Nishi-ku Fukuoka 819-0395, JAP. [f] Mat. Sci. and Eng, MIT 77 Massachusetts Av. Cambridge MA 02139, USA. [g] National Energy Technology Laboratory, Morgantown WV, USA.

10:25 I-12_40/O
Monitoring of the transition metal oxidation state in $Li_xNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ battery cathodes during charging and discharging by SQUID magnetometry
Gregor Klinser [a], Stefan Topolovec [a], Harald Kren [b], Stefan Koller [b], Heinz Krenn [c], Roland Würschum [a]
[a] Institute of Materials Physics, Graz University of Technology, Petersgasse 16, 8010 Graz, Austria. [b] VARTA Micro Innovation GmbH, Graz, Stremayergasse 9, 8010 Graz, Austria. [c] Institute of Physics, University of Graz, Universitätsplatz 5, 8010 Graz, Austria

10:45 BREAK

I-12/10

Chairman: Koji Amezawa

11:00 I-12_41/I
Complexity of mixed conducting perovskite surfaces: A spectromicroscopic case study on $PrBaCo_2O_{6-\delta}$
David N. Mueller [(a)], Margret Giesen [(a)], Felix Gunkel [(a, b)], Matteo Jugovac [(a)], Giovanni Zamborlini [(a)], Vitaliy Feyer [(a)], Regina Dittmann [(a)], Claus. M. Schneider[(a)]*
[(a)]Peter Gruenberg Institute, Research Center Juelich GmbH, Juelich 52425, Germany
[(b)]Institute of Electronic Materials (IWE2), RWTH Aachen University, Aachen 52074, Germany

11:25 I-12_42/O
Quantifying the oxygen stoichiometry of Pr-doped ceria through X-ray diffraction
Christian Lenser [(a)], Yoo Jung Sohn [(a)], Felix Gunkel [(b)], Norbert H. Menzler [(a)]and Olivier Guillon [(a, c)]*
[(a)] Institute of Energy and Climate Research, Materials Synthesis and Processing (IEK-1), Forschungszentrum Jülich GmbH, 52425 Jülich, Germany. [(b)] Institute for Electronic Materials (IWE2), RWTH Aachen University, 52074 Aachen, Germany. [(c)] Jülich Aachen Research Alliance: JARA-Energy. [(b)]Institute of Electronic Materials (IWE2), RWTH Aachen University, Aachen 52074, Germany

11:45 I-12_43/O
Relating Processing, Structure, and Oxygen Surface Exchange Kinetics of $Sr(Ti,Fe)O_{3-\alpha}$ Films by *In-Situ* Optical Absorption Relaxation
*Ting Chen [(a, b)], George. F. Harrington [(c, d)], Kazunari Sasaki [(a, b, c)], and Nicola H. Perry [(b, d)]**
[(a)] Kyushu University, Department of Hydrogen Energy Systems, 744 Motooka, Nishi-ku Fukuoka 819-0395, Japan. [(b)] Kyushu University, International Institute for Carbon-Neutral Energy Research (WPI-I²CNER), 744 Motooka, Nishi-ku Fukuoka 819-0395, Japan. [(c)] Kyushu University, Next-Generation Fuel Cell Research Center (NEXT-FC), 744 Motooka, Nishi-ku Fukuoka 819-0325, Japan. [(d)] Massachusetts Institute of Technology, Department of Materials Science and Engineering, 77 Massachusetts Ave., Cambridge, Massachusetts 02139, U.S.A.

12:05 I-12_44/O
High-Temperature Properties of Piezoelectric $Ca_3TaGa_3Si_2O_{14}$ Single Crystals
Yuriy Suhak [(a)], Hendrik Wulfmeier [(a)], Ward L. Johnson [(b)], Andrey Sotnikov [(c)], Hagen Schmidt [(c)], Holger Fritze [(a)]*
[(a)] Institute of Energy Research and Physical Technologies, Technical University of Clausthal, Goslar, Germany. [(b)] National Institute of Standards and Technology, Boulder, CO, USA. [(c)] SAWLab Saxony, Leibniz Institute for Solid State and Materials Research, Dresden, Germany.

12:25 LUNCH

I-15 – PHOTOCHEMICAL AND PHOTOCATALYTIC ENERGY CONVERSION

A. Padova Fiere

Room A7

I-15/5

Chairman: Francesca Toma

9:00 I-15_16/K
Understanding bulk and interfacial properties of composite photoanodes for water splitting
Roel van de Krol
Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Institute for Solar Fuels, Hahn-Meitner-Platz 1, 14109 Berlin, Germany

9:30 I-15_17/K
Metal oxide nanostructures for photoelectrochemical and electrochemical water splitting
Thomas Bein
University of Munich (LMU), Department of Chemistry and Center for NanoScience (CeNS) Butenandtstr. 5-13, 81377 Munich, Germany

10:00 I-15_18/O
Advancing Design and Discovery of New Materials for Solar Energy Conversion
Jason K. Cooper[(a,b)], Chang-Ming Jiang[(a)], Ian D. Sharp[(a,b)]*
[(a)]Joint Center for Artificial Photosynthesis, Lawrence Berkeley National Laboratory, Berkeley, CA 94720. [(b)]Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720

10:20 I_15_19/O
Development of an Artificial Photosynthesis Device: from the Lab to the Pilot Scale
Simelys Hernández [(a,b)], Nunzio Russo [(a)], Guido Saracco [(b)]*
[(a)] Department of Applied Science and Technology (DISAT), Politecnico di Torino, Turin, Italy. [(b)] Center for Sustainable Future Technologies (CSFT@POLITO), Istituto Italiano di Tecnologia, Turin, Italy

10:40 BREAK

I-15/6

Chairman: Roel van de Krol

11:00 I-15_20/K
Where and how is water oxidized by first-row transition metal oxides?
*Diego Gonzales-Flores, Chiara Pasquini, Paul Kubella, Reza M. Mohammadi, Stefan Loos, Katharina Klingan, Rodney Smith, Ivelina Zaharieva, Petko Chernev, Holger Dau**
Free University Berlin, Dept. of Physics, Arnimallee 14, 14167 Berlin

11:30 I-15_21/K
Molecular vs. solid state strategies for cobalt-based water oxidation catalysts
*Fangyuan Song, Jingguo Li, Karla Lienau, Lukas Reith, Sandra Luber, and Greta R. Patzke**
University of Zurich, Department of Chemistry, Winterthurerstrasse 190, CH-8057 Zurich, Switzerland

12:00 I-15_22/K
"There is a tiny little engine …"
Artur Braun
Empa. Swiss Federal Laboratories for Materials science and Technology, CH – 8600 Dübendorf, Switzerland

12:30 LUNCH

I-16 – SOLAR THERMOCHEMICAL CYCLES BASED ON REDOX-ACTIVE OXYGEN-CONDUCTING METAL OXIDES

A. Padova Fiere

Room A6

I-16/1

Chairman: Ellen Stechel

09:00 I-16_1/K
Materials for Thermochemical Energy Storage and Production of Solar Fuels
*James E. Miller**
Sandia National Laboratories, Advanced Materials Laboratory, 1001 University Blvd. SE, Ste. 100, Albuquerque, NM, 87106, United States of America.

9:30 I-16_2/I
Understanding Redox Reactions of Mn Oxides for Thermochemical Energy Storage
Alfonso J. Carrillo[a], Daniel Sastre[a], David P. Serrano[a,b], Patricia Pizarro[a,b], Juan M. Coronado[b]
[a] Thermochemical Processes Unit, IMDEA Energy Institute, Technology Park of Móstoles, Avenida Ramón de la Sagra, 28935, Móstoles, Madrid, Spain. [b] Chemical and Environmental Engineering Group, ESCET, Rey Juan Carlos University, c/Tulipán s/n, Móstoles, Madrid 28933Madrid, Spain

9:55 I-16_3/I
Doped calcium manganites for large-scale thermochemical energy storage
Gregory S. Jackson[a], Luca Imponenti[a], Kevin J. Albrecht[a], Daniel C. Miller[a], Robert J. Braun[a], and Michael D. Sanders[b]*
[a] Colorado School of Mines, Dept. of Mechanical Engineering, Golden, CO 80401, USA. [b] Colorado School of Mines, Dept. of Metallurgical and Materials Engineering, Golden, CO 80401, USA

10:20 I-16_4/O
Calcium Manganite-Based Materials for High Temperature CSP Thermochemical Energy Storage
Andrea Ambrosini, Sean M. Babiniec , Eric N. Coker , James E. Miller*
Sandia National Laboratories, PO Box 5800 MS 0734, Albuquerque, NM, 87185, USA

10:40 BREAK

I-16/2

Chairman: Andrea Ambrosini

11:00 I-16_5/I
Multi-scale design guidelines for thermochemical fuel processing reactors
*Sophia Haussener**
Laboratory of Renewable Energy Science and Engineering, EPFL, Station 9, 1015 Lausanne, Switzerland

11:25 I-16_6/I
The Multiscale Nature of Solar Fuel Thermochemical Technology
Athanasios G. Konstandopoulos[a,b], Dimitris Dimitrakis[a,b],Souzana Lorentzou[a], Chrysa Pagkoura[a], Margaritis Kostoglou[c], George Karagiannakis[a]*
(a) Aerosol & Particle Technology Laboratory, Chemical Process & Energy Resources Institute, Centre for Research & Technology Hellas, 6th km Charilaou-Thermi, 57001, P.O. Box: 361, Thermi-Thessaloniki, Greece. (b) Department of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece. (c) Department of Chemistry, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece

11:50 I-16_7/I
Metal Oxides in Solar-Thermochemical Cycles: Gaining Breathing Room Through Reactor Design
Ivan Ermanoski
Sandia National Laboratories, PO Box 5800, MS 1415, Albuquerque, New Mexico 87185, United States of America

12:15 LUNCH

MACRO AREA 2: IONICS IN COMMUNICATION AND ROBOTICS

II-1 – LOW-DIMENSIONAL IONIC AND MIXED IONIC/ELECTRONIC CONDUCTOR NANOSTRUCTURES

A. Padova Fiere

Room A5

II-1/1

Chairman: Stephen Skinner

9:00 II-1_1/I
Diffusive memristors for computing
*Zhongrui Wang, Saumil Joshi, Can Li, Rivu Midya, Qiangfei Xia, J. Joshua Yang**
Department of Electrical and Computer Engineering, University of Massachusetts, Amherst, MA 01003, USA

9:25 II-1_2/I
Diffusion in Energy Materials: Insights from Atomistic Modelling
*Alexander Chroneos[a], [b]**
[a] Coventry University, Faculty of Engineering, Environment and Computing, Priory Street, Coventry CV1 5FB, United Kingdom. [b] Imperial College London, Department of Materials, London SW7 2AZ, United Kingdom

9:50 II-1_3/O
The Effect of Charged Point Defects on the Grain Coarsening in Polycrystalline Ceramics
S. N. V. Karra, R. Edwin García
School of Materials Engineering Purdue University

10:10 II-1_4/O
Strong coupling of lattice strain and exsolution in perovskite epitaxial thin film
*Kun Joong Kim[a], Hyeon Han[a], Suenhyoeng Na[a], Daseob Yoon[a], Sun Jae Kim[a], Amir Masoud Dayaghi[a], Jennifer Lilia Marguerite Rupp[b], Tae-Sik Oh[c] and Gyeong Man Choi[a]**
[a] Department of Materials Science & Engineering, Pohang University of Science and Technology (POSTECH), Pohang 37673, Republic of Korea. [b] Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139, USA. [c] Department of Chemical Engineering, Auburn University, Auburn, AL 36849, USA

10:30 BREAK

II-1/2

Chairman: John Kilner

11:00 II-1_5/I
Mass Storage and Transport in Artificial Mixed Conductors
*Chia-Chin Chen, Lijun Fu and Joachim Maier**
Max Planck Institute for Solid State Research, Heisenbergstraße 1, 70569 Stuttgart, Germany

11:25 II-1_6/I
Structure, kinetics and resistive switching in manganite thin films
M. Burriel[a], *D. Pla[a], O. Chaix-Pluchery[a], R. Rodriguez-Lamas[a], M. Boudard[a], H. Roussel[a], C. Pirovano[b], R. N. Vannier[b] and C. Jimenez[a]*
[a] Univ. Grenoble Alpes, CNRS, LMGP, F-38000 Grenoble, France. [b] Univ. Lille, CNRS, Centrale Lille, ENSCL, Univ. Artois, UMR 8181 - UCCS - Unité de Catalyse et Chimie du Solide, F-59000 Lille, France

11:50 II-1_7/I
Design and Application of Strained Interface Heterostructures in Resistive Switching Devices
William J. Bowman[a, b], Sebastian Schweiger [a], Reto Pfenninger [a, c], Ehsan Izadi [b], Amith D. Darbal [d], Peter A. Crozier [b], Jennifer L. M. Rupp [a, c]*
[a] Electrochemical Materials Group, ETH Zürich, Switzerland 8004. [b] School for Engineering of Matter, Transport and Energy Arizona State University, Tempe, AZ 85287. [c] Department of Materials Science and

Engineering, MIT, Cambridge, MA 02139. [d] AppFive LLC, Tempe, AZ 85281

12:15 II-1_8/I
Structure, stability and reactivity of nano-structured metal oxides
*Aleksandra Vojvodic**
University of Pennsylvania, Department of Chemical & Biomolecular Engineering, 220 South 33rd Street, Philadelphia, PA 19104, USA

12:40 II-1_9/O
Ion Migration in Crystalline and Amorphous HfO_x
*Roger A. de Souza**
Institute of Physical Chemistry, RWTH Aachen University, Landoltweg 2, 52062 Aachen, Germany

13:00 LUNCH

II-3 – THE SCIENCE AND TECHNOLOGY OF 2D MATERIALS

B. Fiore di Botta

Room B2

II-3/2

Chairman: Xinliang Feng

11:00 II-3_7/I
Graphene as Active Material for Lithium-Ion Battery Anodes: Is there a future?
*Rinaldo Raccichini, [1, 2] Alberto Varzi, [1, 2] Haiyan Sun, [3] Vittorio Pellegrini, [3] Francesco Bonaccorso, [3] Bruno Scrosati[1, 2, 3], Stefano Passerini[1, 2]**
[1] Helmholtz Institute Ulm (HIU), Helmholtzstrasse 11, 89081 Ulm, Germany. [2] Karlsruhe Institute of Technology (KIT), P. O. Box 3640, 76021 Karlsruhe,
Germany. [3] Istituto Italiano di Tecnologia, Graphene Labs, Via Morego 30, 16163 Genova, Italy.

11:25 II-3_8/O
Bimetal-decorated, Pyridinic N-dominated Large-size Carbon Tubes as Superior Catalyst for Fuel Cells, Metal-air Batteries and Water Electrolyzers
Jian Wang [a] *and Francesco Ciucci** [a,b]
[a] Department of Mechanical and Aerospace Engineering, Hong Kong University of Science and Technology, Kowloon, Hong Kong. [b] Department of Chemical and Biomolecular Engineering, Hong Kong University of Science and Technology, Kowloon, Hong Kong

11:45 II-3_9/O
Graphene and two-dimensional crystals based Li-ion batteries
H Sun, V Pellegrini, and F Bonaccorso*
Istituto Italiano di Tecnologia, Graphene Labs, Via Morego 30, 16163 Genova, Italy

12:05 II-3_10/O
Ultrafast lithium diffusion in bilayer graphene
Matthias Kühne[(a)], Federico Paolucci[(a, b)], Jelena Popovic [(a)], Pavel M. Ostrovsky[(a, c)], Joachim Maier [(a)], Jurgen H. Smet[(a)]*
[(a)] Max Planck Institute for Solid State Research, 70569 Stuttgart, Germany. [(b)] NEST, Istituto Nanoscienze-CNR and Scuola Normale Superiore, 56126 Pisa, Italy
[(c)] L. D. Landau Institute for Theoretical Physics RAS, 119334 Moscow, Russia

12:25 II-3_11/O
Unravelling Surface Basicity and Bulk Morphology of 2D Carbon-based Catalysts with Unique Dehydrogenation Performance
*Giulia Tuci,[(a)] Andrea Rossin,[(a)] Lapo Luconi,[(a)] Housseinou Ba,[(b)] Cuong Pham-Huu, [(b)] Regina Palkovits, [(c)] and Giuliano Giambastiani [(a), *]*
[(a)] Institute of Chemistry of OrganoMetallic Compounds, ICCOM-CNR, Florence, 50019, Italy. [(b)] Institut de Chimie et Procédés pour l'Energie, l'Environ. et la Santé, CNRS Strasbourg, France. [(c)] Institut für Technische und Makromolekulare Chemie, RWTH Aachen University, Germany.

12:45 II-3_12/I
Graphene and other 2d crystals for energy devices
*Vittorio Pellegrini**
Istituto Italiano di Tecnologia,IIT Graphene Labs, Via Morego 30, I-16163 Genova (Italy)

13:10 LUNCH

II-4 – IONICS OF MEMRISTOR/RESISTIVE SWITCHES

B. Fiore di Botta

Room B3

II-4/5

Chairman: Manfred Martin

9:00 II-4_17/I
Nanoionics for Neuromorphic Computing
Matthew J. Marinella, Sapan Agarwal, Robin Jacobs-Gedrim, Alex Hsia, David Hughart, Elliot Fuller, Steve J. Plimpton, Ron Goeke, A. Alec Talin, and Conrad D. James*
Sandia National Laboratories, Albuquerque, NM 87185-1084

9:25 II-4_18/I
Emulating neurological and psychological functions with solid state ionic/electronic conductors
*Xin Guo**
Laboratory of Solid State Ionics, School of Materials Science and Engineering, Huazhong University of Science and Technology, Wuhan 430074, P.R. China

9:50 II-4_19/I
Non-Volatile Redox Transistors for Low Power Computing and Brain-Machine Interfaces
A. Alec Talin*
Sandia National Laboratories, Materials Physics, Livermore, CA 94551, USA

10:15 II-4_20/O
A synaptic transistor based on two-dimensional molybdenum oxide
Dashan Shang, Chuansen Yang, Nan Liu, Xi Shen, Gang Shi, Richeng Yu, Yongqing Li, Young Sun*
Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, P. R. China

10:35 BREAK

II-4/6
Chairman: Manfred Martin

11:00 II-4_21/I
Structural insights into resistance switching in silicon oxide: electronic and photonic perspectives
A. J. Kenyon[(a)], A. Mehonic[(a)], M. S. Munde[(b)], W. H. Ng[(a)], M. Buckwell[(a)], L. Montesi[(a)], K. Zarudnyi[(a)], M. Bosman[(c)], T. Gerard[(a)], A. L. Shluger[(b)]*
[(a)] Department of Electronic and Electrical Engineering, University College London, London WC1E 7JE, UK. [(b)] Department of Physics and Astronomy, University College London, London WC1E 6BT, UK. [(c)] Institute of Materials Research and Engineering, 2 Fusionopolis Way, 138634, Singapore

11:25 II-4_22/O
STM investigation of tantalum oxide thin film switching
Marco Moors[a], Kiran Adepalli[b,c], Anja Wedig[a], Katharina Skaja[a], Rainer Waser[a,d], Bilge Yildiz[b], Ilia Valov[a,d]*
[(a)] Forschungszentrum Jülich GmbH, Peter Grünberg Institut, Wilhelm-Johnen-Str., 52425 Jülich, Germany. [(b)] Massachusetts Institute of Technology, Department of Nuclear Science and Engineering, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139, USA. [(c)] Massachusetts Institute of Technology, Department of Materials Science and Engineering, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139, USA. [(d)] RWTH Aachen, Institut für Werkstoffe der Elektrotechnik 2, Sommerfeldstr. 24, 52074 Aachen, Germany

11:45 II-4_23/O
Pre-History before Memristor: Couliode and Memoriode
Shu Yamaguchi [a] and Hironosuke Ikeda[b]*
(a) Univ. of Tokyo, Dept. of Mater. Engg., 7-3-1 Hongo, Bunkyo-Ku, Tokyo 113-8656, Japan. (b) Sanyo Electrics Co. Ltd., Central R&D Center

12:05 BREAK and LUNCH

MACRO AREA 4: GENERAL ASPECTS, FUNDAMENTALS AND THEORY IN ION-CONDUCTING MATERIALS

IV-3 - INTERFACIAL PROCESSES AND NANOIONICS

B. Fiore di Botta

Room B5

IV-3/3

Chairman: Klaus Funke

9:00 IV-3_10/K
Interfacial Point Defects in the Concentrated Regime
*William C. Chueh**
Department of Materials Science & Engineering, Stanford University, 496 Lomita Mall, Stanford, CA 94305, USA

09:30 IV-3_11/O
Mesoporous oxides with a well-defined architecture as model systems for studying the influence of solid gas-interfaces on electrical transport
Matthias T. Elm [a),(b], Kathrin Michel[a], Matthias Kleine-Boymann[a], Christian Reitz[c], Jürgen Janek[a], Torsten Brezesinski[c]*
[a] Justus-Liebig University, Institute of Physical Chemistry, Heinrich-Buff-Ring 17, 35392 Giessen, Germany. [b] Justus-Liebig University, Institute of Experimental Physics 1, Heinrich-Buff-Ring 17, 35392 Giessen, Germany. [c] Karlsruhe Institute of Technology, Institute of Nanotechnology, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany

9:50 IV-3_12/O
Identifying series of elementary steps in the cathode reactions of SOFCs
*Ilan Riess**
Physics Department, Technion-IIT, Haifa 3200003, Israel

10:10 IV-3_13/O
Chemical Relaxation Experiments on Oxides: Optical Absorption and Electrical Conductivity
Jianmin Shi[a], Changfeng Fan[a], Klaus Dilger[a], Klaus-Dieter Becker[b]*
[a] Institute of Joining and Welding, Technische Universität Braunschweig, Langer Kamp 8, 38106 Braunschweig, Germany. [b] Institute of Physical and Theoretical Chemistry, Technische Universität Braunschweig, Hans-Sommer-Str. 10, 38106 Braunschweig, Germany.

10:30 BREAK

IV-3/4

Chairman Klaus-Dieter Becker

11:00 IV-3_14/I
Single-Layer Ionic Channels by Design
Jacob Sagiv and Rivka Maoz*
Weizmann Institute of Science, Department of Materials and Interfaces, Rehovot 76100, Israel.

11:25 IV-3_15/O
Measuring ionic mobility in mixed-ionic-electronic-conducting nano-dimensioned thin films
Dmitri Kalaev[a], Harry L. Tuller[a], Ilan Riess[b]*
[a] Massachusetts Institute of Technology, Department of Materials Science and Engineering, Cambridge, MA 02139, USA. [b] Technion - Israel Institute of Technology, Physics Department, Haifa 3200003, Israel.

11:45 IV-3_16/O
In-situ Synthesis of Metal Nanoparticles on Functional Oxides through *Heterogeneous Doping*
*No Woo Kwak[a], Seung Jin Jeong[a], Siwon Lee[a], Han Gil Seo[a], Yong Ryun Jo[b], Bong Joong Kim[b], and WooChul Jung[a]**
[a] Korea Advanced Institute of Science and Technology, Materials Science and Engineering, 291, Daehak-ro, Yuseong-gu, Daejeon, 34141, Republic of Korea. [b] Gwangju Institute of Science and Technology, School of Materials Science and Engineering, 123, Cheomdangwagi-ro, Buk-gu, Gwangju, 61005, Republic of Korea.

12:05 BREAK and LUNCH

IV-4 - POINT DEFECT CHEMISTRY OF OXIDE MATERIALS

A. Padova Fiere

Room A4

IV-4/3

Chairmen: Yue. Qi, Juergen Fleig

9:00 IV-4_9/I
First Principles Calculations of Oxygen Vacancies in Perovskites: Key Role of Phonon Contribution in Defect Thermodynamics
E. A. Kotomin[1,2], M. Arrigoni[1], T. S. Bjorheim[3], D. Gryaznov[2] and J. Maier[1]*
[1] Max Planck Institute for Solid State Research, Heisenbergstr. 1, Stuttgart, Germany. [2] Institute for Solid State Physics, University of Latvia, Kengaraga str. 8, Riga, Latvia. [3] Dept. Chemistry, University of Oslo, Gaustadalleen 21, Oslo, Norway

9:25 IV-4_10/I
Impedance spectroscopy analysis using genetic programming (ISGP): a short tutorial
Yoed Tsur[a,b], Alon Oz[a]*
[a] The Nancy and Stephen Grand Technion Energy Program, Technion – Israel Institute of Technology, Haifa 3200003. [b] Department of Chemical Engineering, Technion - Israel Institute of Technology, Haifa, Israel 3200003.

9:50 IV-4_11/O
Assessing the Identifiability of *k* and *D* in Electrical Conductivity Relaxation via Analytical Results and Nonlinearity Estimates
*Ting Hei Wan [a], Mattia Saccoccio[a] and Francesco Ciucci [a], [b]**
[a] Department of Mechanical and Aerospace Engineering, The Hong Kong University of Science and Technology, Hong Kong, SAR China. [b] Department of Chemical and Biomolecular Engineering, The Hong Kong University of Science and Technology, Hong Kong, SAR China.

10:10 IV-4_12/O
Free energy treatment of dopant segregation to grain boundaries in $BaZrO_3$ based on first-principles phonon calculations
Anders Lindman[a], Tor S. Bjørheim[b], Göran Wahnström[a]*
[a] Chalmers University of Technology, Department of Physics, SE-412 96 Gothenburg, Sweden. [b] University of Oslo, Department of Chemistry, FERMiO Gaustadalléen 21, 0349 Oslo, Norway

10:30 BREAK

IV-4/4

Chairmen Eugene Kotomin, Maytal Caspary Toroker

11:00 IV-4_13/O
Computational Studies of Charge Transfer, Oxygen Vacancy Formation and Oxygen Vacancy Ordering in Lanthanum Strontium Ferrite
*Tridip Das Jason D. Nicholas, and Yue Qi**
Michigan State University, Chemical Engineering & Materials Science Department, 428 South Shaw Lane, 2100 Engineering Building, East Lansing, MI 48824, USA

11:20 IV-4_14/I
Solid Oxide Photo-Electrochemical Cells: Modifying Point Defects by Light
*Juergen Fleig**
TU Wien, Institute of Chemical Technologies and Analytics, Getreidemarkt 9, 1060 Wien, Austria

11:45 IV-4_15/O
The voltage and partial pressure dependent defect chemistry of (La, Sr)$FeO_{3-\delta}$ and its effect on chemical capacitance and oxygen exchange kinetics
Alexander Schmid, Ghislain M. Rupp, Jürgen Fleig*
Technical university of Vienna, Electrochemistry, 1060 Getreidemarkt 9, Austria

12:05 IV-4_16/O
On the ionic conduction mechanism in B-Site acceptor doped $Na_{0.5}Bi_{0.5}TiO_3$
Sebastian Steiner[a], Leonie Koch [b], Kai-Christian Meyer[b], In-Tae Seo[a], Till Frömling[a], Karsten Albe[b]*
[a] Institute of Materials Science, Technische Universität Darmstadt, Alarich-Weiss-Straße 2, Darmstadt, Germany, 64287. [b] Institute of Materials Science, Technische Universität Darmstadt, Jovanka-Bonschits-Straße 2, Darmstadt, Germany, 64287

12:25 LUNCH

ORAL PRESENTATIONS

THURSDAY June 22, 2017

PLENARY

A. Padova Fiere

Room A1

Chairman: Harry Tuller

8:00 P4 – Stanley Whittingham
Solid State Ionics – The Key to the Discovery, Introduction and Domination of Lithium Batteries for Portable Energy Storage.
Stanley Whittingham
State University of New York at Binghamton, USA

8:45 BREAK

ISSI ELECTIONS

A. Padova Fiere

Room A1

9:00 – 10:40

All SSI-21 attendees are encouraged to attend the ISSI Election. The new ISSI Vice-President and Board of Directors' members will be elected.

MACRO AREA 1: IONICS IN ENERGY AND ENVIRONMENT

I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS

B. Fiore di Botta

Room B7

10:40 BREAK

I-2/14

Chairmen: Atsuo Yamada, Cristina Tealdi

11:05 I-2_58/I
MnO for 'positive electrode' in lithium-ion batteries
Kisuk Kang
Department of Materials Science and Engineering, College of Engineering, Seoul National University, Korea.

11:30 I-2_59/O
Nanostructured α-Fe_2O_3 and TiO_2 composite enwrapped by reduced graphene oxide with excellent cyclability and rate capability as anode material for lithium ion batteries
Kaspars Kaprans, Janis Mateuss, Anna Dorondo, and Gunars Bajars
Institute of Solid State Physics, University of Latvia, 8 Kengaraga street, Riga, LV-1063, Latvia.

11:50 I-2_60/O
An investigation on electrospun hematite fibers as anode material for sodium-ion rechargeable batteries
Fiore Michele[a], Riccardo Ruffo[a], Claudio Maria Mari[a], Fabiola Pantò[c], Fabrizia Frontera[b], Sara Stellitato[d], and Saveria Santangelo[b]
[a] Università di Milano Bicocca, Dipartimento di Scienze dei Materiali, 20126, Italy

[b] Università "Mediterranea", Dipartimento di Ingegneria Civile, dell'Energia, dell'Ambiente e dei Materiali (DICEAM) , 89122, Italy. [c] Università "Mediterranea", Dipartimento di Ingegneria dell'Informazione, delle Infrastrutture e dell'Energia Sostenibile (DIIES), 89122, Italy. [d] Università della Calabria, Dipartimento di Fisica, 87036, Italy.

12:10 I-2_61/O
Size Dependent Structural and Transport Properties of α-Fe_2O_3
Monika Sharma[1], Dinesh Shukla[2], Sevi Murugavel[1]
[1]Department of Physics and Astrophysics, University of Delhi, Delhi-110007. [2]UGC-DAE Consortium for Scientific Research, University Campus, Khandwa Road, Indore 452 001.

12:30 LUNCH

I-2/15

Chairmen: Kisuk Kang, Craig A. J. Fisher

14:20 I-2_62/I
Superconcentrated ionic liquid electrolytes and their composites: Enabling high specific capacity anodes for Lithium and Sodium batteries.
M. Forsyth, P. C. Howlett, D.R. Macfarlane, M. Hilder, A. Basile, F. Makhlooghiazad, G. Girard, and X. Wang
IFM-Burwood, Deakin University, Burwood Campus, Burwood Highway, Burwood 3125, Australia.

14:45 I-2_63/O
Evidence for a nanosize effect on the structural and high performance electrochemical properties of V_2O_5
Da Huo[a], Barbara Laïk[a], Pierre Bonnet[b], Katia Guérin[b], Céline Cénac-Morthe[c], Rita Baddour-Hadjean[a], and Jean-Pierre Pereira-Ramos[a]
[a] Institut de Chimie et des Matériaux Paris Est, GESMAT, Université Paris Est, UMR 7182, CNRS-UPEC, 2 rue Henri Dunant, F- 94320 Thiais, France. [b] Institut de Chimie de Clermont-Ferrand, UMR 6296 CNRS-Université Blaise Pascal, BP 10448, F-63000 Clermont-Ferrand, France. [c] Centre National d'Études Spatiales, 18 avenue Edouard Belin, F-31401, Toulouse cedex 9, France.

15:05 I-2_64/O
Hierarchical SnS_2 Nanoflowers as High Performance Anode Material for Lithium Ion Batteries
Zijia Zhang[a], Hailei Zhao[a,b], Jiejun Fang[a], Zhaolin Li[a], Lina Zhao[a], and Zhihong Du[a]
[a] University of Science and Technology Beijing, School of Materials Science and Engineering, Beijing 100083, China. [b] Beijing Municipal Key Laboratory of New Energy Materials and Technologies, Beijing 100083, China.

15:25 I-2_65/O
Research Progress on Selected Anode Materials for High-Rate and Long-Life Sodium-Ion Batteries
Yongchang Liu, Li-Zhen Fan
Institute of Advanced Materials and Technology, University of Science and Technology Beijing, Beijing 100083, China.

15:45 BREAK

I-2/16

Chairmen: Maria Forsyth, Craig Fisher

16:15 I-2_66/I
Metal-Free Na-ion Seawater Battery
Youngsik Kim
School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, 44919, South Korea.

16:40 I-2_67/O
Vanadium oxide aerogel: a multi-purpose host for Li- and Na-batteries
Arianna Moretti[a,b], Sangsik Jeong[a,b], Gabriele Giuli[c], Stefano Passerini[a,b]
[a] Helmholtz Institute Ulm (HIU), Electrochemistry I, Helmholtzstrasse 11, 89081 Ulm, Germany. [b] Karlsruhe Institute of Technology (KIT), P.O. Box 3640, 76021 Karlsruhe, Germany. [c] University of Camerino, Geology Division, Via S. Agostino 1, 62032, Camerino, Italy.

17:00 I-2_68/O
Carbon powder material obtained from an innovative high pressure water jet recycling process of tires used as anode in alkali ion (Li, Na) batteries
Mauro Pasquali[a], Gabriele Tarquini[a], Alessandro Dell'Era[a], Francesca Anna Scaramuzzo[a], Paolo De Gasperis[b], and Pier Paolo Prosini[c]
[a] Department S.B.A.I., Sapienza UniversityofRome, Via del Castro Laurenziano 7, I-00161 Roma, Italy. [b] TyrekSrl Via Isonzo 34/36 - 36060 Fellette di Romano d'Ezzelino (VI). [c] ENEA, Italian National Agency for New Technologies,Energy and Sustainable Economic Development, Casaccia Research Centre,Via Anguillarese 301, 00123 Santa Maria di Galeria, Rome, Italy.

17:20 I-2_69/O
Oriented Growth of Metal Sulfides used as High Performance Electrode Materials for Lithium/Sodium ion Batteries
Hailei Zhao [a, b], Yongqiang Teng [a], Zijia Zhang[a], Zhihong Du[a]*
[a] University of Science and Technology Beijing, School of Materials Science and Engineering, Beijing 100083, China. [b] Beijing Municipal Key Laboratory of New Energy Materials and Technologies, Beijing 100083, China

17:40 IV-2_6/I
Recent researches on sodium batteries with solid electrolyte separator
Zhaoyin Wen, Xiangwei Wu, Meifen Wu
CAS Key Laboratory of Materials for Energy Conversion, Shanghai Institute of Ceramics, Chinese Academy of Sciences, 1295 DingXi Road, Shanghai 200050, PR China.

I-3 – ALL SOLID-STATE BATTERIES

B. Fiore di Botta

Room B1

I-3/15: **MODELLING SESSION**

Chairman: Wolfgang Zeier

11:00 I-3_66/I
Descriptor for Lithium Ion Conductivity based on Lattice Dynamics
Sokseiha Muy[1], John C. Bachman[2], and Yang Shao-Horn[1,2]
[1] Department of Materials Science and Engineering. [2] Department of Mechanical
Engineering, Massachusetts Institute of Technology, USA.

11:25 I-3_67/O
Diffusion Mechanism in the Superionic Conductor Li_4PS_4I by First-Principles Calculations
Sabrina Sicolo[a], Stefan J. Sedlmaier[b], Jürgen Janek[b,c], Karsten Albe[a]
[a] Technische Universität Darmstadt, Institut für Materialwissenschaft, Jovanka-Bontschits-Str. 2, D-64287 Darmstadt, Germany. [b] Karlsruhe Institute of Technology, BELLA Battery and Electrochemistry Laboratory, Institute of Nanotechnology (INT), Hermann-von-Helmholtz-Platz 1, D-76344 Eggenstein-Leopoldshafen, Germany. [c] Justus-Liebig-University Giessen, Institute of Physical Chemistry, Heinrich-Buff-Ring 17, D-35392 Giessen, Germany.

11:45 I-3_68/O
Modelling and Simulation of Solid State Batteries
Katharina Becker-Steinberger[a,b], Marie Preuße[a,b,c], Simon Schardt[a,b,c], and Arnulf Latz[a,b,c]
[a] Helmholtz Institute Ulm for Electrochemical Energy Storage, Helmholtzstrasse 11, 89081 Ulm, Germany. [b] German Aerospace Center, Institute of Engineering Thermodynamics, Pfaffenwaldring 9, 70569 Stuttgart, Germany. [c] Kahrlsruhe Institute of Technology, Campus North, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany.

12:05 I-3_69/O
Efficient Exploration of Fast Li-ion Conductors Li-Zn-O-X Using Materials Simulation with Infomatics
H. Yamasaki[a], M. Nakayama[b-d], R. Jalem[b,c,e], and I. Takeuchi[b,c]
[a] Battery Research Dept. Battery Material Engineering & Research Div. TOYOTA Motor Corporation, Higashifuji Technical Center 1200, Mishuku, Susono, Shizuoka, 410-1193 Japan. [b] Frontier Research

Institute of Materials Science, Nagoya Institute of Technology, Nagoya, Aichi 466-8555, Japan. [c] GREEN & MI2I, National Institute for Materials Science (NIMS), Tsukuba, Ibaraki 305-0047, Japan. [d] Elements Strategy Initiative for Catalysts and Batteries (ESICB), Kyoto University, Kyoto 615-8245, Japan. [e] PRESTO of Japan Science and Technology Agency, Saitama 332-0012, Japan.

12:25 I-3_70/O
Atomistic modelling of $Li_{1+x}Al_xTi_{2-x}(PO_4)_3$, a promising solid state electrolyte material.

Dave Case and Pooja M. Panchmatia [*]*
Loughborough University, Department of Chemistry, Loughborough, UK.

12:45 LUNCH

I-3/16: MODELLING / INTERFACES SESSION

Chairmen: Mickael Dolle, Sven Uhlenbruck

14:15 I-3_71/I
Li-Ion Transport Process, Doping Effects, and Stability in Garnet-Type Solid Electrolytes: Insights from Computations and Experiments

Randy Jalem[a,b] and Masanobu Nakayama[b,c,d]
[a] JST PRESTO, K's Gobancho Building 7, Gobancho Chiyoda-ku, Tokyo 102-0076, Japan. [b] National Institute for Materials Science, Namiki 1-1, Tsukuba, Ibaraki 305-0044, Japan. [c] Nagoya Institute of Technology, Gokiso-cho, Showa-ku, Nagoya, Aichi 466-8555 Japan. [d] Unit of Elements Strategy Initiative for Catalysts & Batteries (ESICB), Kyoto University, Katsura, Saikyo-ku, Kyoto 615-8520 Japan.

14:40 I-3_72/O
In-situ non-destructive measurements of Li distribution in a buried interface between an electrode and a solid electrolyte

Issei Sugiyama[a], Masahiro Saitoh[b], Noboru Miyata[c], Takayasu Hanashima[c], Kazuhiro Akutsu[c], Yuji Otsuka[b], Masayasu Takeda[d], Ryota Shimizu[a], and Taro Hitosugi[a,e]
[a] School of Materials and Chemical Technology, Tokyo Institute of Technology, Tokyo 152-8550, Japan. [b] Toray Research Center, Inc., Shiga 520-8567, Japan. [c] CROSS Tokai, Ibaraki 319-1106, Japan. [d] JAEA, Ibaraki 319-1184, Japan. [e] Advanced Institute for Materials Research, Tohoku Univ., Miyagi 980-8577, Japan.

15:00 I-3_73/O
Ion and Electron Transport in Li_2O: A Model Compound for the Anode-Electrolyte Interface

Simon Lorger, Robert Usiskin, and Joachim Maier
Max Planck Institute for Solid State Research, 70569 Stuttgart, Germany.

15:20 I-3_74/O
First-Principles Study on Effects of Buffer Layer, Li Depletion, and Ion Mixing at Interfaces between $LiCoO_2$ and Sulfide Electrolyte in All-Solid-State Battery

Yoshitaka Tateyama[a,b,c], Jun Haruyama[a], and Keitaro Sodeyama[b,c,d]
[a] Center for Green Research on Energy and Environmental Materials and Global Research Center for Environment and Energy Nanoscience (GREEN), National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan. [b] Center for Materials Research by Information Integration, NIMS, 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, Japan. [c] Elements Strategy Initiative for Catalysts & Batteries, Kyoto University, Goryo-Ohara, Nishikyo-ku, Kyoto 612-8245, Japan. [d] PRESTO, Japan Science and Technology Agency, 4-1-8 Honcho, Kawaguchi, Saitama 333-0012, Japan.

15:40 I-3_75/O
Two-dimensional X-ray absorption spectroscopic analysis of reaction distribution in composite cathodes for bulk-type all-solid-state lithium-ion batteries

Mahunnop Fakkao[a], Kazuki Chiba[a], Abhilasha Devaraj[b], Yuta Kimura[b], Takashi Nakamura[b], Toyoki Okumura[c], Kiyofumi Nitta[d], Yasuko Terada[d], Yoshiharu Uchimoto[e], and Koji Amezawa[b]
[a] Graduate School of Engineering, Tohoku University, 6-6-04, Aramaki Aza Aoba Aoba-ku, Sendai, Miyagi 980-8579, Japan. [b] Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai 980-8577, Japan. [c] Research Institute of Electrochemical Energy, National Institute of Advanced Industrial Science and Technology (AIST), 1-8-31 Midorigaoka, Ikeda, Osaka 563-8577, Japan. [d] Japan Synchrotron Radiation Research Institute (JASRI), 1-1-1 Kouto, Sayo-cho, Sayo-gun, Hyogo 679-5198, Japan. [e] Graduate School of Human and Environmental Studies, Kyoto University, Yoshida-nihonmatsu cho, Sakyo-ku, Kyoto, 606-8501, Japan.

16:00 BREAK

I-3/17

Chairmen: Mickael Dolle, Sven Uhlenbruck

16:20 I-3_76/I
Microscopic Insights into Conductivity and Stability of Solid Electrolyte Interfaces

Miaofang Chi[a], Jeff Sakamoto[b], and Nancy Dudney[c]
[a] Center for Nanophase Materials Sciences, [c] Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee, United States. [b] Department of Mechanical Engineering, University of Michigan, Ann Arbor, Michigan, United States.

16:45 I-3_77/O
Energy Levels and Defect Formation at Ionic Interfaces: a Key to the Understanding of Double Layer- and Reaction Layer Formation

René Hausbrand[a], Mathias Fingerle[a], Karsten Albe[b], and Sabrina Sicolo[b]
[a] Darmstadt University of Technology, Institute of Material Science – Surface Science Division, Jovanka-Bontschits-Str. 2, 64287 Darmstadt, Germany. [b] Darmstadt University of Technology, Institute of Material Science – Materials Modeling Division, Jovanka-Bontschits-Str. 2, 64287 Darmstadt, Germany.

17:05 I-3_78/O
Interface chemistry of solid electrolyte/electrode interfaces probed by x-ray spectroscopy and scattering

Gulin Vardar[a], Jiayue Wang[a], Qiyang Lu[b], Rachel Seibert[c], Zhengrong Lee[c], Yet-Ming Chang[b], Jeff Terry [c], and Bilge Yildiz[a,b]
[a] Department of Nuclear Science and Engineering – Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139, U.S.A. [b] Department of Materials Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139, U.S.A. [c] Department of Physics, Illinois Institute of Technology, 3101 S. Dearborn Street, Chicago, IL 60616, U.S.A.

17:25 I-3_79/O
Rapid Sintering of Cerium Oxide Ceramics

Nimrod Yavo[a], Asaf Nissenbaum[a], Orit Mendelson[c], Igor Lubomirsky[a], and Ori Yehezkel[b]
[a] Department of Materials and Interfaces, Weizmann Institute of Science, Rehovot, Israel. [b] Department of Materials, Nuclear Research Center Negev, Beer-Sheva, 84190, Israel. [c] Department of Chemistry, Nuclear Research Center Negev, Beer-Sheva, 84190, Israel.

17:45 I-3_80/O
Unambiguous Electrical Identification of Lithium Ion Solid Electrolytes in Electrochemical Cells

Eui-Chol Shin[a], Su-Hyun Moon[a], Thuy Linh Pham[a], Huyen Tran Tran[a], Hang Thi Thu Le, Yu-Guo Guo[b], Michael Weissmayer[c], Joachim Maier[c], Jaekook Kim[a], Chan-Jin Park [a], and Jong-Sook Lee[a]
[a] Chonnam National University, School of Materials Science and Engineering, Gwangju 61186, Korea. [b] Institute of Chemistry, Chinese Academy of Sciences (CAS), Beijing 100190, China, Korea. [c] Max-Planck-Institut für Festkörperforschung, D-70569 Stuttgar, Germany.

I-5 – POLYMER ELECTROLYTE IONOMERS: ADVANCES IN CATION- AND ANION-EXCHANGE MEMBRANES AND ION CONDUCTION

B. Fiore di Botta

Room B9

I-5/3

Chairman: Vito Di Noto

11:00 I-5_9/I
Hybrid membranes for PEM fuel cells based on two-dimensional nanostructures and molecular dynamic studies by NMR methods
Isabella Nicotera
Department of Chemistry and Chemical Tech., University of Calabria, 87036 Rende (CS), Italy

11:25 I-5_10/I
Expertise in Perfluoro Sulfonic Acid (PFSA) ionomer characterization - application for FC degradation
Corine Bas, Gilles De Moor, Lionel Flandin
University Savoie Mont Blanc, LEPMI- UMR5279, F-73000 Chambéry, (France)

11:50 I-5_11/O
Composite anion exchange membranes based on polysulfone and lamellar MgAl double hydroxides
R. Narducci [a,b,c], P. Knauth [b,c], M. L. Di Vona [a,c]*
[a]University of Rome Tor Vergata (URoma2), Department of Industrial Engineering, Via del Politecnico 1, 00133 Roma, Italy [b]Aix Marseille Univ (AMU), CNRS, Madirel (UMR 7246), Electrochemistry of Materials Group, Campus St Jérôme, 13397 Marseille, France [c]International Associated Laboratory (L.I.A.), Ionomer Materials for Energy (AMU, CNRS, URoma2)

12:10 I-5_12/O
Development of Nondestructive Testing Method for Fuel Cells Analyses
Danny Gelman[a], Alon Oz[b], Yoed Tsur[a][b]*
[a] Department of Chemical Engineering, Technion - Israel Institute of Technology, Haifa, Israel 3200003 [b] The Nancy and Stephen Grand Technion Energy Program, Technion – Israel Institute of Technology, Haifa 3200003

12:30 LUNCH

I-5/4

Chairman: Peter Pintauro

14:20 I-5_13/I
Understanding Water and Ion Transport in ETFE-based Membranes and Ionomers in Operating Anion Exchange Membrane Fuel Cells
*Travis J. Omasta[a], Lianqin Wang[b], John R. Varcoe[b] and William E. Mustain[a]**
[a] University of Connecticut, Department of Chemical & Biomolecular Engineering, 191 Auditorium Rd, Unit 3222; Storrs, CT 06269, USA [b] University of Surrey, Department of Chemistry, GU2 7XH, Guildford, UK

14:45 I-5_14/I
Alkaline Stability and H_2/O_2 Fuel Cell Durability of Anion Exchange Membrane
Nanwen Li, Lei Liu, Jiayou Liao*
State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan, 030001, China.

15:10 I-5_15/O
Hybrid Perfluorosulfonic Acid Nanofiber Composite Membrane
*Leslie Dos Santos, Devon Powers, Ryszard Wycisk and Peter N. Pintauro**
Vanderbilt University, Department of Chemical and Biomolecular Engineering, Olin Hall Nashville TN 37235-1604, USA.

15:30 I-5_16/O
Proton transport properties in organized thin films
Yuki Nagao[a],Yutaro Ono[a],Ryosuke Goto[b],Mitsuo Hara[b],Shusaku Nagano[c]*
[a] School of Materials Science, Japan Advanced Institute of Science and Technology, 1-1 Asahidai, Nomi, Ishikawa 923-1292, Japan
[b] Department of Molecular Design & Engineering, Graduate School of Engineering, Nagoya University, Furo-cho, Chikusa, Nagoya 464-8603, Japan [c] Nagoya University Venture Business Laboratory, Nagoya University, Furo-cho, Chikusa, Nagoya 464-8603, Japan

15:50 BREAK

I-5/5

Chairman: Michael Hickner

16:15 I-5_17/I
Proton conducting composite membranes mechanically reinforced through hydrophilic and/or hydrophobic ionomer - filler interactions
Mario Casciola[a], Anna Donnadio[b], Monica Pica[b], Alessandra Carbone[c], Irene Gatto[c], Giuseppe Portale[d]*
[a] Università di Perugia, Dipartimento di Chimica and CEMIN, via Elce di Sotto 8, Perugia, Italy. [b]Università di Perugia, Dipartimento di Scienze Farmaceutiche, via del Liceo 1, Perugia, Italy [c]CNR-ITAE, Via S. Lucia sopra Contesse, 5, 98125 Messina, Italy [d] Univ. Groningen, Zernike Inst. Adv. Mat., Macromol. Chem. & New Polymer Mat., Nijenborgh 4 NL-9747 AG Groningen, The Netherlands

16:40 I-5_18/I
Optimizing cationic conductance through electrolyte thinning and use of single-cation conductors
Thiam Amadou[1,2], Martinez-Cisneros Cynthia[3], Antonelli Claire[4], Iojoiu Cristina[1], Jean-Yves Sanchez[1,3].*
[1] Univ.Grenoble & CNRS, LEPMI, F-38000, Grenoble. [2] LRCS, Université Picardie, 33 rue St.Leu, F-80039 [3] Universidad Carlos III de Madrid, Materials Science and Engineering Dept. Sp-28911 [4] IEM - UMR5635, F-34090 Montpellier.

17:05 I-5_19/O
From Polyelectrolytes to Robust, Highly Proton Conducting Hydrocarbon Membranes for PEM Fuel Cell Applications
Torben Saatkamp[a], Giorgi Titvinidze[b], Andreas Münchinger[a], Jan-Patrick Melchior[a], Klaus-Dieter Kreuer[a]*
[a] Max-Planck-Institute for Solid State Research, Physical Chemistry of Solids, Heisenbergstraße 1, D-70569 Stuttgart, Germany [b] Agricultural University of Georgia, Georgia, 0131 Tbilisi, 240 David Aghmashenebeli Alley

17:25 I-5_20/O
Modified polydimethylbenzimidazolium (DMPI) systems as novel anion exchange membranes for alkaline polymer fuel cells (AAEMFC)
Simone Angioni[a], Nicolò Pianta[a], Eliana Quartarone [a], Piercarlo Mustarelli [a]*
[a] University of Pavia, Department of Chemistry, Via Taramelli 12, 27100, Pavia, Italy

17:45 I-5_21/O
Enhanced H_2/Air Fuel Cell Performance of Multiblock Aromatic Ionomers with Pendant Sulfoalkoxyl Side Chain
Tiandu Dong, Mitsuru Ueda, Xuan Zhang and Lianjun Wang*
Jiangsu Key Laboratory of Chemical Pollution Control and Resources Reuse, School of Environmental and Biological Engineering, Nanjing University of Science & Technology, 200 Xiaolingwei, Nanjing 210094, Jiangsu Province, China

I-6 – HIGH-TEMPERATURE PROTON-CONDUCTING POLYMER MEMBRANES

B. Fiore di Botta

Room B10

I-6/1

Chairman: Werner Lehnert

16:15 I-6_1/I
Tailoring PBI Membranes for New Devices
*Andrew Pingitore, Guoqing Qian, Brian C. Benicewicz**
University of South Carolina, Department of Chemistry and Biochemistry, 541 Main Street, Horizon I Bldg, Columbia, SC 29208 USA

16:40 I-6_2/I
PBI-based high temperature blend membranes for electrochemical processes such as H_2S electrolysis and fuel cells
Jochen Kerres[a,b]*, Henning Krieg[b], Vladimir Atanasov[a], Retha Peach[b], Karin Aniol[a], Patrizia Cichon[a], Florian Mack[c], Roswitha Zeis[c]
[a] University of Stuttgart, Institute of Chemical Process Engineering, Boeblinger Str. 78, Stuttgart, Germany. [b] North-West University, Focus Area, Chemical Resource Beneficiation, Faculty of Natural Science, Potchefstroom, South Africa. [c] Karlsruhe Institute of Technology (KIT), Helmholtz Institute Ulm (HIU), Ulm, Germany

17:05 I-6_3/I
Sulfonated Aromatic Ionomers for High Temperature Electrochemical Devices
Maria Luisa Di Vona [a,c], Riccardo Narducci [a,b,c], Emanuela Sgreccia [a,c], Philippe Knauth [b,c]*
[a] University Rome Tor Vergata (URoma2), Dep Industrial Engineering, Via del Politecnico 1, 00133 Roma, Italy. [b]Aix Marseille University (AMU), CNRS, Madirel (UMR 7246), 13397 Marseille, France. [c]International Associated Laboratory (L.I.A.), Ionomer Materials for Energy (AMU, CNRS, URoma2) France/Italy

17:30 I-6_4/O
Membranes for Hotter and Drier Proton Exchange Membrane Fuel Cell Operation Based on the Heteropoly Acids.
Andrew M. Herring, Andrew R. Motz, Tara P. Pandey , and Mei-Chen Kuo*
Colorado School of Mines, Department of Chemical and Biological Engineering, Golden, CO 80401, USA.

17:50 I-6_5/I
Use of ^1H – ^2H isotope exchange with neutron radiography in fuel cell research
*Pierre Boillat[a],[b]**
[a] Paul Scherrer Institute (PSI), Electrochemistry Laboratory (LEC), Neutron Radiography of Electrochemical Systems Group (NRES), 5232 Villigen, Switzerland. [b] Paul Scherrer Institute (PSI), Laboratory for Neutron Scattering and Imaging (LNS), Neutron Imaging and Activation Group (NIAG), 5232 Villigen, Switzerland

I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS

A. Padova Fiere

Room A2

I-9/14: **SOFC Cathodes VI**

Chairman: Gyeong Man Choi

11:00 I-9_67/O
Understanding of the Ce-Cu catalytic activity of $Ce_{1-x}Cu_xO_{2-\delta}$ oxides for Partial Oxidation Reforming
Amane Abdoun [a], John T.S Irvine [a], Sung-Pil Yoon [b]*
[a] University of St Andrews – School of Chemistry, Fife, KY16 9ST, United Kingdom [b] Korea Institute of Science and Technology KIST – Fuel Cell Research Center, Seoul 136-791, Republic of Korea.

11:20 I-9_68/O
Scandia-Stabilized Zirconia Coated Silver Cathode for High-Performance Intermediate Temperature Solid Oxide Fuel Cells
*Hyung Jong Choi, Manjin Kim, Kiho Bae, Dong Hwan Kim, Gwon Deok Han, Jun Woo Kim, Junmo Koo and Joon Hyung Shim**
School of Mechanical Engineering, Korea University, 145 Anam-ro, Seongbuk-gu, Seoul 02841, South Korea.

11:40 I-9_69/O (Cancelled, now I-9_13)
Study of $La_4BaCu_{5-x}Co_xO_{13\pm\delta}$ material as potential cathode for IT-SOFC
*Silvia Duran[a,b], Jhoan Tellez[a,c], Mario Macias[c], Pascal Roussel[b], Konrad Świerczek[d], Leopoldo Suescun[c] and Gilles H. Gauthier[a]**
[a] Universidad Industrial de Santander, INTERFASE, Bucaramanga, Colombia. [b] Univ. Lille, CNRS, Centrale Lille, ENSCL, Univ. Artois, UMR 8181 - UCCS - Unité de Catalyse et Chimie du Solide, F-59000 Lille, France. [c] Universidad de la Republica, Facultad de Química, Cryssmat-Lab, Montevideo, Uruguay. [d] AGH University of Science and Technology, Faculty of Energy and Fuels, Krakow, Poland.

12:00 I-9_70/O
Fabrication of solid oxide fuel cell cathode using a low cost commercial inkjet printer
*Gwon Deok Han, Hyung Jong Choi, Kiho Bae, Hyeon Rak Choi, Suk Won Park, Dong Young Jang, Jun Woo Kim, and Joon Hyung Shim**
Renewable Energy System Laboratory, School of Mechanical Engineering, Korea University, 145 Anam-ro, Seongbuk-gu, Seoul 02841, South Korea.

12:20 LUNCH

I-9/15: **SOFC Cathodes VII - Composites**

Chairman: Henny Bouwmeester

14:20 I-9_71/O
Perovskite composite cathodes for intermediate temperature solid oxide fuel cells
Felix Shin[a], Wen Xu[a], Marco Zanella[a], Karl Dawson[b], Stanislave N. Savvin[a], John B. Claridge[a] and Matthew J. Rosseinsky[a]*
[a] University of Liverpool, Department of Chemistry, Grove Street, Liverpool L69 7ZD, UK. [b] University of Liverpool, School of Engineering, Grove Street, Liverpool L69 7ZE, UK

14:40 I-9_72/O
Fabrication and electrical characterization of composite 8YSZ-$Ce_{0.8}Sm_{0.2}O_{2-\delta}$ and $Ce_{0.8}Sm_{0.2}O_{2-\delta}$-$Ce_{0.8}Gd_{0.2}O_{2-\delta}$ thin ceramic tapes for Solid Oxide Fuel Cells
*Ashutosh Kumar Shahi, Onkar Nath Verma, Prabhakar Singh**
Department of Physics, IIT(BHU), Varanasi-221005, India

15:00 I-9_73/O
Optimization of LSCF/CGO electrode for SOFC based on a 3D numerical model
Özden Çelikbilek[a,b]*, David Jauffres[b], Elisabeth Siebert[a], Christophe L. Martin[b], Elisabeth Djurado[a]
[a] Grenoble Alpes, CNRS, Grenoble INP*, LEPMI, F-38000, Grenoble, France [b] Grenoble Alpes, CNRS, Grenoble INP*, SIMAP, F-38000, Grenoble, France *Institute of Engineering Univ. Grenoble Alpes

15:20 I-9_74/O
Characterization of $La_{0.7}Sr_{0.3}MnO_3$/ $Zr_{0.84-x}Ce_xY_{0.16}O_{0.96}$ (x=0, 0.42, 0.84) composite SOFC cathodes using electrochemical impedance spectroscopy
*Sara Paydar[a], I. Gholaminezad[b], H. Shirani[a], Z. Saleh[a], M.H. Paydar[a], Sirous Javadpour[a]**
[a] Department of Materials Science and Engineering, School of Engineering, Shiraz University, Shiraz, Iran [b] School of Mechanical Engineering, Shiraz University, Shiraz, Iran

15:40 I-9_75/O
Microstructural Study and Conductivity of NiO/YSZ Composite Cathode Materials Prepared via Modified Glycine-Nitrate Process
*Felix Rey Bueta, Rinlee Butch Cervera**
Department of Mining, Metallurgical and Materials Engineering, College of Engineering, University of the Philippines Diliman, Quezon City, 1101 Philippines

16:00 BREAK

I-9/16: **SOFC Anodes III and SOECs**

Chairman: John Irvine

16:15 I-9_76/O
Gadolinia doped ceria model systems and model composites as a pathfinder for sulfur tolerant and redox stable SOFC anodes
Matthias Gerstl[a),(b)], Michael Doppler[a),(b)], Martin Bram[b),(c)], Jürgen Fleig[a)], Alexander K. Opitz[a),(b)]*
[a)] TU Wien, Department of Electrochemistry, Vienna, Austria [b)] Christian Doppler Laboratory for Interfaces in Metal-Supported Electrochemical Energy Converters, Forschungszentrum Juelich, D-52425 Jülich, Germany [c)] Forschungszentrum Juelich GmbH, Institute of Energy and Climate Research, Juelich, Germany

16:35 I-9_77/O
One-pot synthesis of silver-modified sulfur-tolerant anode for SOFCs with an expanded operation temperature window
*Jifa Qu[a)], Wei Wang[b)], Tao Yang[c)], Yubo Chen[a)], Zongping Shao[a, b)]**
[a)] State Key Laboratory of Materials-Oriented Chemical Engineering, College of Chemistry & Chemical Engineering, Nanjing Tech University, Nanjing 210009, China [b)] Department of Chemical Engineering, Curtin University, Perth, WA 6845, Australia [c)] Department of Mechanical Engineering, University of Aveiro, 3810-193, Portugal.

16:55 I-9_78/O
Multiphase oxygen electrodes for solid oxide electrolysis cells
Đorđije Tripković, Peter Vang Hendriksen, Mogens Bjerg Mogensen*
Technical University of Denmark, DTU Energy, Frederiksborgvej 399, Roskilde, Denmark

17:15 I-9_79/O
Enhanced performance of direct carbon dioxide electrolysis with nano-socketed Ni-Fe particles grown by *in-situ* exsolution
Yihang Li, Changrong Xia*
Key Laboratory of Materials for Energy Conversion, Chinese Academy of Sciences, Department of Materials Science and Engineering & Collaborative Innovation Center of Suzhou Nano Science and Technology, University of Science and Technology of China, No. 96 Jinzhai Road, Hefei, Anhui Province, 230026, P. R. China.

17:35 I-9_80/O
Performance of infiltrated LSCF as an electrode for solid oxide electrolyzer
*Justyna Bartoszek [a)], Aleksander Chrzan [a)]Jakub Karczewski [b)], Yi-Xin Liu [c)], Sea-Fue Wang [c)] and Piotr Jasinski [a)]**
[a)] Faculty of Electronics, Telecommunications and Informatics, Gdańsk University of Technology, ul. Narutowicza 11/12, 80-233 Gdańsk, Poland [b)] Faculty of Applied Mathematics and Physics, Gdańsk University of Technology, ul. Narutowicza 11/12, 80-233 Gdańsk, Poland [c)] Institute of Materials Science and Engineering, National Taipei University of Technology, Taiwan, R.O.C.

17:55 I-9_81/O
Infiltrated mesoporous materials as electrode for Solid Oxide Electrolyser Cells
E. Hernández, M. Torrell, F.Baiutti, A. Morata, A. Tarancón*
Catalonia Institute for Energy Research (IREC), Department of Advanced Materials for Energy Jardins de les Dones de Negre, 1, 08930 Sant Adrià de Besòs, Barcelona, Spain

I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS

B. Fiore di Botta

Room B6

I-10/11

Chairman: Chiara Maccato

11:00 I-10_45/I
In situ X-ray studies during the early stage of ZnO Atomic Layer Deposition on InGaAs
Evgenii Skopin[a)], Marie-Ingrid Richard[b)], Laetitia Rapenne[a)], Alexandre Crisci[c)], Elisabeth Blanquet[c)], Gianluca Ciatto[d)], Jean-Luc Deschanvres[a)], Dillon D. Fong[e)], Hubert Renevier[a)]
[a)] Univ. Grenoble Alpes, CNRS, LMGP, F-38000 Grenoble, France [b)] Aix-Marseille Université, CNRS, Université de Toulon, IM2NP UMR 7334, 13397 Marseille Cedex 20, France [c)] Univ. Grenoble Alpes, CNRS, SIMAP, F-38000 Grenoble, France [d)] Synchrotron SOLEIL, L'Orme des Merisiers, Saint-Aubin, F-91192, Gif sur Yvette, France [e)] Argonne National Laboratory, Bldg 241/C222, 9700 S. Cass Ave., Argonne, IL 60439, USA

11:25 I-10_46/O
Phase Transition of TiO_2 Nanotube Arrays: an X-ray Study
Mauro Pasquali[a)], Francesca Anna Scaramuzzo[a)], Alessandro Dell'Era[a)], Gabriele Tarquini[a)], Paolo Ballirano[b)]*
[a)]Department S.B.A.I., Sapienza University of Rome, Via Castro Laurenziano 7, I-00161 Roma, Italy [b)]Departmentof Earth Sciences, Sapienza University of Rome,P.le Aldo Moro 5, I-00185 Roma, Italy

11:45 I-10_47/O
Oxygen vacancies and nonmetal dopant species in anatase TiO_2: A lesson learned?
Daniela Meroni[a,b,], Leonardo Lo Presti[a,c], Lucia Silvestrini[d], Michele Ceotto[a], Silvia Ardizzone[a,b]*
[a] Dpt. Chemistry, Università degli Studi di Milano, via Golgi 19 20133 Milano, Italy [b] Consorzio INSTM, via Giusti 9 50121 Firenze, Italy [c] CMC, Aarhus University, Langelandsgade 140 DK-8000, Aarhus, Denmark [d] Dpt. Applied Genetics and Cell Biology, BOKU University, Konrad Lorenz Strasse 24 A-3430 Tulln/Donau, Austria

12:05 I-10_48/O
Anodic titanium oxides: production and engineered applications
Maria Vittoria Diamanti, Andrea Brenna, Marco Ormellese, Barbara Del Curto, MariaPia Pedeferri*
Politecnico di Milano, Department of Chemistry, Materials and Chemical Engineering "G. Natta", Via Mancinelli 7, 20131 Milan, Italy

12:25 LUNCH

I-10/12

Chairman: Alberto Gasparotto

14:20 I-10_49/I
Metal oxides nanowires: technologies for chemical sensors
Elisabetta Comini[a)], Angela Bertuna[a)], Navpreet Kaur[a)], Hashitha M. M. Munasinghe Arachchige [a)], Nicola Poli[a)], Marco Rizzoni[a)], Orhan Sisman[a)], Dario Zappa[b)], Giorgio Sberveglieri[a)]*
[a)] SENSOR Lab – Università degli Studi di Brescia, Department of Information Engineering, Via Valotti 7, 25123, Brescia Italy. [b)] SENSOR Lab – CNR-INO, U.S. Brescia, Via Branze 43, 25123, Brescia, Italy.

14:45 I-10_50/O
Barium hexa-ferrite as an innovative sensing material for ozone detection
*Daniele Ziegler, Andrea Marchisio, Paola Palmero, Jean-Marc Tulliani**
Department of Applied Science and Technology, Politecnico di Torino, Corso Duca degli Abruzzi, 24, 10129, ITALY

15:05 I-10_51/O
Simple Solution-processed Rapid Synthesis Strategy of Co_3O_4 *Micro*-dandelions For High Performance H_2S Sensors
Sachin Navale, Chenshitao Liu, Florian Stadler
College of Materials Science and Engineering, Shenzhen Key Laboratory of Polymer Science and Technology, Guangdong Research Center for Interfacial Engineering of Functional Materials, Nanshan District Key Lab for Biopolymers and Safety Evaluation, Shenzhen University, Shenzhen 518060, P. R. China.

15:25 BREAK

I-10/13

Chairman: Urska Lavrencic Stangar

16:15 I-10_52/O
ZnO and ZnO/Au Thin Films: Chemoresistive Properties in Photo-activation Mode for Gas Sensing Applications
Andrea Gaiardo[1,2], Barbara Fabbri[1], Vincenzo Guidi[1], Pierluigi Bellutti[2], Matteo Valt[1], Giancarlo Pepponi[2], Cesare Malagù[1], Sandro Gherardi[1], Giulia Zonta[1], Nicolo Landini[1]
(1) Department of Physics and Earth Sciences, University of Ferrara, Via Saragat 1/c, 44122 Ferrara, Italy (2) MNF - Micro Nano Facility, Bruno Kessler Foundation, Via Sommarive 18, 38123 Trento, Italy

16:35 I-10_53/O
Degenerately Doped Metal Oxide Nanocrystals as Plasmonic and Chemoresistive Gas Sensors
Marco Sturaro[a], Enrico Della Gaspera[b], Carlo Cantalini[c], Massimo Guglielmi[a], Alessandro Martucci[a]*
(a) Università di Padova, Dipartimento di Ingegneria Industriale, Padova, Italy (b) RMIT University, School of Science, Melbourne, VIC, Australia (c) Università di L'Aquila, Dipartimento di Ingegneria Industriale, L'Aquila, Italy

16:55 I-10_54/O
A Thermo-piezoelectric Generator Based on Patterned N-doped ZnO Nanorods
Alessandro Soffientini, Giorgio Spinolo and Umberto Anselmi Tamburini
Dipartimento di chimica, Università di Pavia, Italy

17:15 I-10_55/O
Methal oxide thin films for memristive devices prepared by Sol-Gel and PMCS routes
Laura Pasquardini [a,b,], Danit Gemechu Ayana[a], Valentina Prusakova[a], Giovanni Giusti[b], Cristian Collini[c], Lorenzo Lunelli[c], Riccardo Ceccato[a], Lia Vanzetti[c], Andrea Chiappini[d], Alessandro Chiasera[d], Marco Vittorio Nardi[a,b], Maurizio Ferrari[d], Leandro Lorenzelli[c], Roberto Verucchi[b], Salvatore Iannotta[c], Sandra Dire[a]*
(a) Dept. of Industrial Engineering, University of Trento, via Sommarive 14, 38123 Trento, Italy; (b) IMEM-CNR, Via alla Cascata 56/C, 38123 Trento, Italy; (c) Fondazione Bruno Kessler (FBK), CMM, Via Sommarive 18, 38123 Trento, Italy; (d) IFN-CNR CSMFO Lab., Via alla Cascata 56/C, Povo, 38123 Trento, Italy; (e) IMEM-CNR, Parco Area delle Scienze 37/A, 43124 Parma, Italy;

I-11 – FUNCTIONAL METAL OXIDE INTERFACES IN EFFICIENT ELECTROCHEMICAL ENERGY CONVERSION, BIOMASS CONVERSION AND CHARGE STORAGE SYSTEMS

B. Fiore di Botta

Room B4

I-11/4

Chairmen: Gunther Rupprechter, Pawel Kulesza

11:00 I-11_14/I
Chemical Routes to Electron-Rich Polyoxometalates
R. John Errington
School of Chemistry, Newcastle University, Newcastle upon Tyne, NE1 7RU, UK

11:25 I-11_15/I
Design of Original Porphyrin-Polyoxometalate Electropolymers for the Photoelectrochemical Energy Conversion
*Ruhlmann Laurent**
Laboratoire d'Electrochimie et de Chimie Physique du Corps Solide, Institut de Chimie, UMR 7177, Université de Strasbourg, 4 rue Blaise Pascal, 67000, Strasbourg, France

11:50 I-11_16/I
Recent advances in photoelectrochemical hydrogen production using semiconductor metal-oxide electrode
Jan Augustynski*
University of Warsaw, Centre for New Technologies, Banacha 2c, 02-097 Warsaw, Poland

12:15 I-11_17/I
Oxide Semiconductors, Solid-State Chemistry, and Photoelectrochemistry: A Nexus
Krishnan Rajeshwar
The University of Texas at Arlington, Arlington, TX, USA

12:40 I-11_18/I
Photoelectrochemical Scanning Droplet Cell Microscopy for High Throughput Screening of Functional Oxide Libraries
Achim Walter Hassel [a, b], Andrei Ionut Mardare [a], Jan Philipp Kollender [a] Armin Sebastian Guntner [b]*
(a) Institute for Chemical Technology of Inorganic Materials, Johannes Kepler University Linz, Altenberger Str. 69, 4040 Linz, Austria (b) Christian Doppler Laboratory for Combinatorial Oxide Chemistry, Johannes Kepler University Linz, Altenberger Str. 69, 4040 Linz, Austria

13:05 LUNCH

I-11/5

Chairmen: Enn Lust, Jan Augustynski

14:20 I-11_19/O
MCr_2O_4-based spinels as materials for anodic catalyst support in PEM electrolysis cells: boosting the LT conductivity of corrosion stable p-type conductors
Filippo Fenini, Kent K. Hansen, Mogens B. Mogensen*
Technical University of Denmark, Department of Energy Conversion and Storage, Roskilde, Denmark

14:40 I-11_20/O
Oxygen permeation optimization of CO_2 & SO_2 stable dual-phase membranes via surface catalytic activation
*J. García-Fayos, M. Balaguer, J.A. Escribano, J.M. Serra **
Instituto de Tecnología Química (Universidad Politécnica de Valencia-Consejo Superior de Investigaciones Científicas), Ave los Naranjos S-N, E-46022 Valencia, Spain.

15:00 I-11_21/O
Efficient electricity storage with a battolyser, an integrated Ni–Fe battery and electrolyser
Fokko Mulder[a], Bernhard Weninger[b]*
(a) Delft University of Technology, Chemical Engineering, van der Maasweg 9, 2629HZ Delft, The Netherlands.

15:20 I-11_22/O
Electrochemical Redox Behavior of $LaSr_3Fe_3O_{10-\delta}$ in Alkaline Solutions
Kohei Miyazaki, Yuto Miyahara, Tomokazu Fukutsuka, Takeshi Abe
Graduate School of Engineering, Kyoto University, Kyoto-daigaku-katsura, Nishikyo-ku Kyoto 615-8510, JAPAN

15:40 I-11_23/O
Metal-oxide interaction for infiltrated Ni nanoparticles on A-site deficient $La_xSr_{1-3x/2}TiO_3$ (x=0, 0.2, 0.4) ceramic surfaces
Jianing Hui, Dragos Neagu, Chengsheng Ni, John T. S. Irvine*
School of Chemistry, University of St Andrews, North Haugh, St Andrews, Fife KY16 9ST, UK

16:00 BREAK

I-11/6

Chairmen: Nicolas Alonso-Vante, Sara Cavaliere

16:15 I-11_24/O
Anionic doping (F^-, Cl^-) as the way of improving transport properties of proton-conducting perovskite systems
Nataliia Tarasova, Irina Animitsa
Ural Federal University, Institute of Natural Sciences and Mathematics, 620000, Ekaterinburg, Mira str.19, Russia

16:35 I-11_25/O
Thermal Properties of Proton Conducting Ceramics
Aleksandra Mielewczyk-Gryń
Gdańsk University of Technology, Faculty of Applied Physics and Mathematics, Department of Solid State Physics Narutowicza 11/12 80-233 Gdańsk, Poland

16:55 I-11_26/O
Catalysts of cathode for the protonic ceramic fuel cells
Jong-Sung Park, Minho Shin, Baek Kim*
Department of Material Science and Engineering, Myongji University, Yongin, Gyeonggi-do 17058, Korea

17:15 I-11_27/O
Smoothing of steam injection for electrolysis experiments and hydrogen recovery with soft mica as sealing
*Pierre Coquoz [a], Noelia Coton [a], Florian Cottier [a], Andre Pappas [a], Hugh Middleton [b], Raphael Ihringer [a]**
[a] Fiaxell Sàrl, EPFL Science Parc, PSE A, 1015 Lausanne, Switzerland [b] Faculty of Engineering Science, University of Agder, 4879 Grimstad, Norway

17:35 I-11_28/O
Methane-fueled, proton-conducting ceramic fuel cell stacks
*Hanping Ding, Long Le, Neal P. Sullivan**
Mechanical Engineering Department, Colorado Fuel Cell Center, Colorado School of Mines, 1500 Illinois Street, Golden, Colorado, USA 80401

17:55 I-11_29/O
$LiFePO_4$ coated carbon foam as cathode for 3D micro batteries: electrochemical modelling using finite element methodology
*Priit Priimägi [a] *, Habtom D. Asfaw [b], Shruti Srivastav [b], Heiki Kasemägi [a], Alvo Aabloo [a], Daniel Brandell [b], Vahur Zadin [a]*
[a]IMS Lab, Institute of Technology, Tartu University, Nooruse 1, 504 11 Tartu, Estonia [b]Department of Chemistry - Ångström Laboratory, Uppsala University, Box 538, SE-751 21 Uppsala, Sweden.

I-12 – DEFECT CHEMISTRY, TRANSPORT AND REACTIVITY AT GAS/ELECTRODE INTERFACES

B. Fiore di Botta

Room B10

I-12/11

Chairman: Tatsuya Kawada

11:00 I-12_45/O
Initial Defect Model of Gas Sensitive $BaFe_{1-x}Ta_xO_{3-\delta}$ Films
Murat Bektas, Thomas Stöcker, Gunter Hagen, Ralf Moos*
University of Bayreuth, Department of Functional Materials, Universitätsstraße 30, 95447 Bayreuth, Germany

11:20 I-12_46/O
Mixed potential type acetone sensor based on CeO_2 and $AMnO_3$ (A= La, Sm, Sr and Ca) sensing electrode
Xue Yang, Tong Liu, Ce Ma, Bin Wang, Xishuang Liang, Geyu Lu**
State Key Laboratory on Integrated Optoelectronics, College of Electronic Science and Engineering, Jilin University, 2699 Qianjin Street, Changchun 130012, China

11:40 I-12_47/O
NASICON-based mixed potential type SO_2 sensor utilizing $La_xSm_{1-x}FeO_3$ sensing electrode
Ce Ma, Xue Yang, Xidong Hao, Fangmeng Liu, Xishuang Liang, Geyu Lu**
State Key Laboratory on Integrated Optoelectronics, College of Electronic Science and Engineering, Jilin University, 2699 Qianjin Street, Changchun 130012, China

12:00 I-12_48/O
Li-Garnet Based Potentiometric Sensors for CO_2 Concentration Monitoring
Michal Struzik [a, b], Reto Pfenninger [a, b], Andreas Nenning [a, b], Jennifer L. M. Rupp [b]*
[a] ETH Zurich, Department of Materials, Hoenggerbergring 64, Switzerland [b] Massachusetts Institute of Technology, Department of Material Science and Engineering, 77 Massachusetts Ave., Cambridge, Massachusetts, United States

12:20 LUNCH

I-16 – SOLAR THERMOCHEMICAL CYCLES BASED ON REDOX-ACTIVE OXYGEN-CONDUCTING METAL OXIDES

A. Padova Fiere

Room A6

I-16/3

Chairman: William Chueh

11:00 I-16_8/K
Facts and prospects on solar thermochemical processes applying redox materials
*Martin Roeb**
German Aerospace Center, Institute of Solar Research, Linder Hoehe, 51147 Koeln, Germany

11:30 I-16_9/I
Solar thermochemical CO_2 splitting via redox cycling with low-cost metal-oxide nanostructures
Xiang Gao[a], Guanyu Liu[a], Ye Zhu[b], Peter Kreider[a], Alicia Bayon[c], Thomas Gegenbach[d], Jim Hinkley[c], Wojciech Lipiński[a], and Antonio Tricoli[a]***
[a] The Australian National University, Research School of Engineering, Canberra, ACT 2601, Australia. [b] Monash University, Department of Materials Engineering, Melbourne, VIC 3800, Australia. [c] CSIRO Energy, P.O. Box 330, Newcastle, NSW 2300, Australia. [d] CSIRO Manufacturing, Bayview Avenue, Melbourne, VIC 3168, Australia.

11:55 I-16_10/O
Thermochemical CO_2 dissociation using $Ce_{0.8}Zr_{0.15}Sc_{0.05}O_{2-\delta}$
Ryo Hishinuma [a], Keji Yashiro [b], Shin-ichi Hashimoto [b], Tatsuya Kawada[b]*
[a] School of Engineering, Tohoku Univercity, 6-6-01 Aramaki Aoba, Aobaku, Sendai 980-8579, Japan [b] Graduate school of Environmental Studies, Tohoku Univercity, 6-6-01 Aramaki Aoba, Aobaku, Sendai 980-8579, Japan

12:15 I-16_11/O
Hydrogen Generation by Water Splitting in Membrane Reactors
Mikhail V. Patrakeev, Alexey A. Markov, Ilya A. Leonidov, Victor L. Kozhevnikov*
Institute of Solid State Chemistry UB RAS, 620990 Pervomayskaya str. 91, Yekaterinburg, Russia

12:35 LUNCH

I-16/4

Chairman: Ellen Stechel

14:20 I-16_12/I
Discovery of Novel Materials for Solar Thermochemical Water Splitting from High-Throughput First-Principles Calculations
*Chris Wolverton**
Northwestern University, Department and Materials Science and Eng., Evanston, IL USA

14:45 I-16_13/I
Rapid Computational Screening of Materials for Solar Thermal Water Splitting Using Ab Initio and Machine Learned Models
[1]Samantha Miller-Millican, [1]Ryan Trottier, [1]Chris Bartel, [1,2]Aaron Holder, [1]Al Weimer, and [1,3]Charles Musgrave
[1]Department of Chemical and Biological Engineering, University of Colorado, Boulder, Colorado 80309-0215, USA [2]Materials and Chemical Science and Technology, National Renewable Energy Laboratory, Golden, CO 80401, USA [3]Department of Chemistry and Biochemistry, University of Colorado, Boulder, Colorado 80309-0215, USA

15:10 I-16_14/O
Materials for thermochemical redox reactions: Computational chemistry, experiments and simulation
Souzana Lorentzou [(a)],Dimitris Dimitrakis[(a,b)], Maria Syrigou[(a,b)], Margaritis Kostoglou[(c)], George Karagiannakis [(a)], Athanasios G. Konstandopoulos [(a,b)]*
(a) Aerosol & Particle Technology Lab., Chemical Process & Energy Resources Inst., Centre for Research & Technology Hellas (APTL/CPERI/CERTH), 6th km Charilaou-Thermi, 57001, P.O. Box: 361, Thermi-Thessaloniki, Greece (b) Department of Chemical Engineering, Aristotle Univ. of Thessaloniki (AUTH), Thessaloniki 54124, Greece (c) Department of Chemistry, Aristotle Univ. of Thessaloniki (AUTH), Thessaloniki 54124, Greece

15:30 I-16_15/O
Solar-to-Fuel Conversion based on Redox-Active Perovskites
Jennifer L. M. Rupp[(a)], Alexander H. Bork[(a)], Markus Kubicek[(b,c)], Erwin Povoden-Karadeniz[(c)], Alfonso J. Carrillo[(a,b)]
[(a)] Massachusetts Institute of Technology, Department of Materials Science and Engineering, Cambridge, USA [(b)] ETH Zürich, Department of Materials, Zürich, Switzerland [(c)] TU Wien, Institute of Chemical Technologies and Analytics, Vienna, Austria

15:50 BREAK

I-16/5

Chairman: Andrea Ambrosini

16:15 I-16_16/I
How ceria redox membranes split CO_2 and H_2O with concentrated solar energy
Ronald Michalsky, Maria Tou, Aldo Steinfeld*
ETH Zürich, Department of Mechanical and Process Engineering, Sonneggstrasse 3, 8092 Zürich, Switzerland

16:40 I-16_17/I
Development of novel characterization and solar reactor technologies for two-step solar thermochemical cycles based on redox-active mixed ionic and electronic conducting materials
*Peter G. Loutzenhiser**
Georgia Institute of Technology, Georgia W. Woodruff School of Mechanical Engineering, 801 Ferst Drive, Atlanta, Georgia 30332-0405, USA

17:05 I-16_18/I
Solar thermochemical energy conversion using perovskite oxides and other promising routes
Jonathan Scheffe, Richard Carrillo, Kangjae Lee, Kent Warren*
University of Florida, Department of Mechanical and Aerospace Engineering, 231 MAE-A Building, Gainesville, FL 32611, United States

17:30 I-16_19/O
Thermochemical CO_2 Reduction Reaction and *Operando* Analysis of Electronic Structure for $La_{0.6}Sr_{0.4}MnO_{3-\delta}$
Junji Hyodo[(a)], Kentaro Yamamoto[(a)], Kenta Hoshino[(b)], Hiroyuki Setoyama[(c)], Toshihiro Okajima[(c)], Yoshihiro Yamazaki[(a),(b)*]*
[(a)] INAMORI Frontier Research Center, Kyushu University, Fukuoka 819-0395, Japan [(b)] Department of Materials Science and Engineering, Kyushu University, Fukuoka 819-0395, Japan [(c)]SAGA Light Source, Kyushu Synchrotron Light Research Center, Saga 841-0005, Japan

I-17 – MESOSCOPIC SOLAR CELLS

A. Padova Fiere

Room A7

I-17/1

Chairman: Emmanuelle Delporte

11:00 I-17_1/I
Consequences of solid electrolyte interphase (SEI) formation upon ageing on charge transfer processes in dye-sensitized solar cells
*Frédéric Sauvage**
Laboratoire de Réactivité et Chimie des Solides, Université de Picardie Jules Verne, CNRS UMR7314, 33 rue Saint Leu, 80039 Amiens Cedex

11:25 I-17_2/I
Thermal degradation chemistry of ruthenium complexes in the dye-sensitized solar cell and strategies for reducing the dark current
Torben Lund[(a)] and Phuong Tuyet Nguyen[(a),(b)]*
[(a)]Department of Science and Environment, Roskilde University, DK-4000, Denmark [(b)]Faculty of Chemistry, University of Science, Vietnam National University – Ho Chi Minh City, Vietnam

11:50 I-17_3/O
Critical Aspects of Electron and Ion Transport that will Enable Dye-Sensitized Solar Cells with > 20% Efficiencies
Hsiang-Yun Chen[(a)], Joseph M. Cardon[(a)], Kevin Tkacz[(b)], Jacqueline Angsono[(a)], Gregory Krueper[(c),(d)], Shane Ardo[(a),(b)]*
University of California Irvine, [(a)] Department of Chemistry, [(b)] Department of Chemical Engineering and Materials Science, [(c)] Department of Applied Physics, and [(d)] Department of Electrical Engineering, Irvine, CA, USA

12:10 I-17_4/O
Quasi-solid Cellulose-based Aqueous Electrolytes for Sustainable DSSCs
Marisa Falco[(a)], Simone Galliano[(b)], Guido Viscardi[(b)], Claudia Barolo[(b)], Michael Grätzel[(c)], Claudio Gerbaldi[(a)], Federico Bella[(a)]*
[(a)] GAME Lab, CHENERGY Group, Department of Applied Science and Technology (DISAT), Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 - Torino, Italy [(b)] Department of Chemistry, NIS Interdepartmental Centre and INSTM Reference Centre, Università degli Studi di Torino, Via Pietro Giuria 7, 10125 Torino, Italy [(c)] Laboratory of Photonics and Interfaces, Institut des Sciences et Ingénierie Chimiques, École Polytechnique Fédérale de Lausanne (EPFL), Station 3, CH1015 Lausanne, Switzerland

12:30 LUNCH

I-17/2

Chairman: Frédéric Sauvage

14:20 I-17_5/I
Excitonic emission of hybrid lead iodide perovskite single crystals
Hiba Diab[(a)], Gaëlle Trippé-Allard[(a)], Ferdinand Lédée[(a,b)], Khaoula Jemli[(a,b)], Guillaume Bouchez[(c)], Christèle Vilard[(c)], Vincent L.R. Jacques[(d)], Antonio Tejeda[(d)], P. Audebert[(b)], Jean-Sébastien Lauret[(a)], Damien Garrot[(a)] and Emmanuelle Deleporte[(a)]*
[(a)]Laboratoire Aimé Cotton, ENS Cachan, UPSud, Univ. Paris-Saclay, Orsay, 91405, France. [(b)]PPSM, ENS Cachan, Université Paris-Saclay, 94235 Cachan, France [(c)]Groupe d'Etude de la Matière Condensée, UVSQ, Versailles, 78035, France. [(d)]Laboratoire de Physique des Solides, Université Paris-Sud, Orsay, 91405, France

14:45 I-17_6/I
Unusual photoluminescence emissions in lead halide perovskites and their molecular origin
*Simone Meloni**
Department of Mechanical and Aerospace Engineering, University of Rome Sapienza

15:10 I-17_7/O
Electrodeposited CZTS Solar Cells from the Ionic Liquid Electrolyte Choline-Urea for Photovoltaic Application
Sara Azmi [(a)], Luca Pezzato [(b)], Marco Sturaro[(b)], Alessandro Martucci[(b)], Khoumri El Mati[(a)], Manuele Dabala [(b)]*
[(a)] Laboratory of Physical Chemistry and Bioorganic Chemistry – University Hassan II, Casablanca, Morocco [(b)] Industrial Engineering Department – University of Padova, Padova Italy.

15:30 I-17_8/O
High efficient scalable graphene doped Electron Transport Layer (ETL) for perovskite photovoltaic devices fabricated through full-automated Spray Coating technique
Babak Taheri, Antonio Agresti, Sara Pescetelli, Narges Yaghoobinia, Lucio Cinà, Fabio Matteocci, Aldo Di Carlo*
University of Rome Torvergata CHOSE - Electrical Engineering Department - Via Politecnico 1, 00133 Roma

15:50 BREAK

I-17/3

Chairman: Simone Meloni

16:15 I-17_9/I
Simulation of mesoscopic solar cells: the role of internal interfaces
*Alessio Gagliardi**
Technische Universität München, Electrical and Computer Engineering, 80333, Munchen, Germany

16:40 I-17_10/O
Study of the electrochemical activity of nanostructured NiO prepared via rapid discharge sintering
Matteo Bonomo,[a] Vittoria Novelli,[a] Andrea Giacomo Marrani,[a] Muhammad Awais,[b] Denis P. Dowling,[c] Han Vos,[d] Danilo Dini[a]*
[(a)] Department of Chemistry, University of Rome LA SAPIENZA, P.le A. Moro 5, 00185 Rome, Italy [(b)] Department of Industrial Engineering, Taibah University, Medina, Saudi Arabia [(c)] School of Mechanical & Materials Engineering, University College Dublin (UCD), Belfield, Dublin 4, Ireland [(d)] School of Chemical Sciences, Dublin City University (DCU), Glasnevin, Dublin 9, Ireland

17:00 I-17_11/O
Observation of Device ITO/MoO_3/P3HT:$PC_{61}BM$/Ca/Al, through impedance spectroscopy
*Abhishek Sharma, J.P.Tiwari**
CSIR - Network of Institutes for Solar Energy (NISE), Advanced Materials and devices division (Organic and Hybrid Solar Cell Group), CSIR-National Physical Laboratory, Dr. K. S. Krishnan Marg, New Delhi-110012 India

17:20 I-17_12/O
Effect of Annealing Cycles on the Properties of CZTS Layers for Thin Film Solar Cells
*Narges Ataollahi[a], Elisa Cappelletto[a], Fabrizio Girardi[a], Claudia Malerba[ab], Rosa Di Maggio[a], Paolo Scardi[a]**
[a] Department of Civil, Environmental and Mechanical Engineering, University of Trento, Via Mesiano 77, 38123, Trento, Italy. [b] ENEA, Casaccia Research Center, Via Anguillarese 301,00123, Roma, Italy

MACRO AREA 2: IONICS IN COMMUNICATION AND ROBOTICS

II-1 – LOW-DIMENSIONAL IONIC AND MIXED IONIC/ELECTRONIC CONDUCTOR NANOSTRUCTURES

A. Padova Fiere

Room A5

II-1/3

Chairman: Jennifer Rupp

11:00 II-1_10/I
Interface manipulation of ionic/electronic conduction for crucial materials of high energy density lithium batteries
Xiangxin Guo, Zhonghui Cui, Ning Zhao, Yiqiu Li, Yingbin Tan, Xiaomin Li
Shanghai Institute of Ceramics, Chinese Academy of Sciences, DingXi Road 1295, Shanghai 200050, P. R. China

11:25 II-1_11/I
Enhanced Performance of Perovskite O_2-electrode in Solid Oxide Electrochemical Cells through the Strain-driven Chemical Stabilization
*Bonjae Koo[(a)], Hyunguk Kwon[(b)], YeonJu Kim[(a)], Han Gil Seo[(a)] , Jeong Woo Han [(b)] and WooChul Jung [(a)]**
[(a)] Korea Advanced Institute of Science and Technology (KAIST), Department of Materials Science and Engineering, Daejeon, Republic of Korea [(b)] University of Seoul (UOS), Department of Chemical Engineering, Seoul, Republic of Korea

11:50 II-1_12/I
Thermodynamic processes and defect concentration profiles at complex oxide interfaces and surfaces
F. Gunkel[(a), (b)], R. Heinen[(b)], M. Andrä[(b)], S. Hoffmann-Eifert[(b)], R. Waser[(a), (b)], R. Dittmann[(b)]
[(a)] IWE2 and JARA-FIT, RWTH Aachen University, 52074 Aachen, Germany
[(b)] PGI7, Forschungszentrum Jülich GmbH, Jülich, Germany

12:15 II-1_13/I
Linear diffusion model for determination of the height of the potential barrier at grain boundaries of ion-conducting oxides
S. K. Kim[(a)], S. Khodorov[(b)], C-Y. S. Chang[(a)], I. Lubomirsky[(b)], S. Kim[(a)]
[(a)] Department of Chemical Engineering and Materials Science, University of California, Davis, USA [(b)] Department of Materials Science and Interfaces, Weizmann Institute of Science, Rehovot, Israel

12:40 II-1_14/O
From Material Design to Mechanism Study: Nanoscale Ni Exsolution on a Highly Active A-site Deficient Anode Material for Solid Oxide Fuel Cells
Francesco Ciucci[(a, b)] and Yang Gao[(a)]*
[(a)] The Hong Kong University of Science and Technology, Mechanical and Aerospace Engineering, Clearwater Bay, Kowloon, Hong Kong, China SAR [(b)] The Hong Kong University of Science and Technology, Chemical and Biomolecular Engineering, Clearwater Bay, Kowloon, Hong Kong, China SAR

13:00 LUNCH

II-1/4

Chairman: Vincenzo Esposito

14:20 II-1_15/I
Oxide Ion Conduction in YSZ / Rare Earth Sesquioxides Multilayers – Interface Strain in Competition with Blocking Grain Boundaries
Carsten Korte[(a)], Johannes Keppner [(a, b)], Andreas Peters[(b)], Halit Aydin[(b)] and Jürgen Janek[(b)]*
[(a)] Forschungszentrum Jülich, Institut für Energie- und Klimaforschung (IEK-3), Jülich/D [(b)] Justus-Liebig-Universität Gießen, Physikalisch-Chemisches Institut, Gießen/D

14:45 II-1_16/O
Equilibrium and Transport Properties in Charged Grain Boundaries
S. N. V. Karra, R. Edwin García*
School of Materials Engineering, Purdue University, West Lafayette, IN, USA

15:05 II-1_17/O
High ionic conductivity in confined heterostructures
Simone Sanna, Vincenzo Esposito, Nini Pryds*
Department of Energy, Technical University of Denmark, DK-4000 Roskilde, Denmark

15:25 II-1_18/O
Nanostructured Ce and Pr oxides as exceptional mixed conducting fuel and oxygen electrocatalysts
Christopher Graves, Christodoulos Chatzichristodoulou, Simon Pitscheider, Lev Martinez, Bhaskar Reddy Sudireddy*
Technical University of Denmark, Department of Energy Conversion and Storage, Frederiksborgvej 399, 4000 Roskilde, Denmark

15:45 BREAK

A. Padova Fiere

Room A3

Joint Session

Chairmen: Yoed Tsur, Nini Pryds, Peter Crozier

16:15 IV-4_26/K
Beyond electrostatic effects at oxide hetero-interfaces: Electrochemical phase change, strong electric fields, and elastic strain
*Qiyang Lu[(a)], Mostafa Youssef[(a, b)], Jing Yang[(a)], Sean Bishop[(a)], Dongkyou Lee[(c)], Hendrik Bluhm[(d)], Ho Nyung Lee[(c)], Krystyn Van Vliet[(a)], Harry Tuller[(a)], and Bilge Yildiz[(a, b)]**
[(a)] Dept. of Materials Sci. and Engineering, [(b)] Dept. of Nuclear Science and Engineering, Massachusetts Institute of Technology [(c)] Materials Science and Technology Division, Oak Ridge National Laboratory [(d)] Chemical Sciences Division, Lawrence Berkeley National Laboratory

16:45 IV-4_27/I
The surface space-charge layer in oxides: detection, description and consequences
*Roger A.de Souza**
[(a)] Institute of Physical Chemistry, RWTH Aachen University, Landoltweg 2, 52062 Aachen, Germany

17:10 II-1_19/I
Influence of strain on the oxygen ion and proton conductivity of thin films
*T. Lippert[1, 2, *], A. Fluri[1], D. Pergolesi[1], A. Wokaun[1], N. Marzari[3], A. Marcolongo[3], V. Roddatis[4]*
[1] Thin Films & Interfaces Group, Research with Neutrons and Muons Division, Paul Scherrer Institut, 5232 Villigen-PSI. Switzerland [2] Laboratory of Inorganic Chemistry, ETH Zurich, Vladimir Prelog Weg 1, 8093 Zurich, Switzerland [3] Theory and Simulations of Materials (THEOS), and National Centre for Computational Design and Discovery of Novel Materials (MARVEL), École Polytechnique Fédérale de Lausanne, Station 12, 1015 Lausanne, Switzerland. [4] Institut für Materialphysik, Universität Göttingen, Friedrich-Hund-Platz 1, Göttingen 37077, Germany.

17:35 II-1_20/I
X-ray Studies of Oxygen Vacancy Behavior in Complex Oxide Heterostructures
*Dillon D. Fong**
Argonne National Laboratory, Materials Science Division, 9700 S. Cass Ave., Bldg 241/A164, Argonne, Illinois 60439, USA

II-2 – REALIZATION OF NEW FUNCTIONAL OPTOELECTRONIC OXIDE BASED MATERIALS: EXPERIMENT AND THEORY

B. Fiore di Botta

Room B8

II-2/3

Chairman: David Ginley

11:00 II-2_8/I
Chemical bonding view of transparent conductiving oxides
Hiroshi Mizoguchi
Materials Research Center for Element Strategy, Tokyo Institute of Technology, 4259 Nagatsuta, Midori-ku, Yokohama 226-8503, Japan

11:25 II-2_9/I
Defect Modulation Doping
*Andreas Klein**
Technische Universität Darmstadt, Institute of Materials Science, Jovanka-Bontschits-Str. 2, 64287 Darmstadt, Germany

11:50 II-2_10/I
MBE growth chemistry and bulk vs. surface electron transport of the transparent semiconducting oxides Ga_2O_3, In_2O_3, and SnO_2
*Oliver Bierwagen **
Paul-Drude-Institut für Festkörperelektronik, Hausvogteiplatz 5—7, 10117 Berlin, Germany.

12:15 LUNCH

II-3 – THE SCIENCE AND TECHNOLOGY OF 2D MATERIALS

B. Fiore di Botta

Room B2

II-3/3

Chairman: Vittorio Pellegrini

11:00 II-3_13/K
Electronic and Optical Properties of Atomically Thin Semiconductors
Tony F. Heinz
Depts. of Applied Physics and Photon Science, Stanford University, Stanford, CA 94305, USA and SLAC National Accelerator Laboratory, Menlo Park, CA 94025, USA

11:30 II-3_14/I
Recent trends in graphene transport and plasmonics
*Marco Polini**
Istituto Italiano di Tecnologia, Graphene Labs, Via Morego 30, I-16163 Genova, Italy

11:55 II-3_15/I
Photonics of van der Waals heterostructures
Goki Eda[*(a)(b)]*
[(a)] Department of Physics/Chemistry, National University of Singapore, Singapore [(b)] Graphene Research Centre, National University of Singapore, Singapore

12:20 II-3_16/O
Sound and Light in 3D Graphene
Flavio Giorgianni[a], Carlo Vicario[a], Mostafa Shalaby[a], Lorenzo Tenuzzo[b], Augusto Marcelli[c], Christoph Hauri[a], and Stefano Lupi[b]*
[(a)] Paul Scherrer Institute, SwissFEL, 5232 Villigen-PSI, Switzerland [(b)] Department of Physics, University of Rome La Sapienza, P. le A. Moro 2, 00185, Rome, Italy [(c)] INFN-LNF, via E. Fermi 40, 00044 Frascati, Italy

12:40 LUNCH

II-3/4

Chairman: Luigi Colombo

14:20 II-3_17/K
Light Scattering and Emission from Hetero-structures
Andrea C. Ferrari
Cambridge Graphene Centre, University of Cambridge, Cambridge, CB3 OFA, UK

14:50 II-3_18/I
Graphene integration
Amaia Zurutuza
Graphenea S. A. – Tolosa Hiribidea 76, Donostia-San Sebastian, 20018, Spain

15:15 II-3_19/O
Synthesis and characterization of MoS_2 crystals
Antonios Michail[a, b], Dimitris Anestopoulos[b], Nick Delikoukos[a, b], John Parthenios[a], Costas Galiotis[a, c] and Konstantinos Papagelis[a, b]*
[a] FORTH / ICE-HT, Stadiou str. Platani GR-26504, Patras, Greece [b] Department of Physics, University of Patras, GR-26504, Patras, Greece [c] Department of Chemical Engineering, University of Patras, GR-26504, Patras, Greece

15:35 II-3_20/I
Graphene and Beyond: Creating and Exploring Atomically-Thin Materials and Heterostructures
Joshua A. Robinson
Department of Materials Science & Engineering; The Center for 2D and Layered Materials; The Center for Atomically Thin Multifunctional Coatings; and The 2D Crystal Consortium, The Pennsylvania State University, University Park, PA 16802

16:00 BREAK

II-3/5

Chairman: Andrea Ferrari

16:15 II-3_21/K
Synthesis and Applications of Functionalized Graphene
Maurizio Prato[a,b]
[a] Center of Excellence for Nanostructured Materials (CENMAT), INSTM UdR di Trieste, Dipartimento di Scienze Chimiche e Farmaceutiche, University of Trieste, Trieste, Italy [b] CIC BiomaGUNE, Parque Tecnológico de San Sebastián, Paseo Miramón, 182, 20009 San Sebastián (Guipúzcoa), Spain

16:45 II-3_22/I
Synthesis and Applications of Novel Two-Dimensional Nanomaterials
*Hua Zhang**
Center for Programmable Materials, School of Materials Science and Engineering, Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798, Singapore

17:10 II-3_23/I
Supramolecular approaches to 2-D materials: from complex structures to sophisticated functions
*Paolo Samorì**
ISIS, Université de Strasbourg & CNRS, 8 allée Gaspard Monge, 67000 Strasbourg, France.

17:35 II-3_24/O
Towards the use of graphene for biomedical applications: evaluation of neuronal and glial biocompatibility
Fabrizia Cesca[a, b], Mattia Bramini[a, b], Fabio Benfenati[a, b, c]*
[a] Istituto Italiano di Tecnologia (IIT), Center for Synaptic Neuroscience and Technology, L. go Rosanna Benzi, 10 – 16132 Genova – Italy [b] IIT Graphene Labs, via Morego, 30 – 16163 Genova – Italy [c] University of Genova, Dept. of Experimental Medicine, Viale Benedetto XV – 16132 – Italy

17:55 II-3_25/O
Physical Adsorption on Low-Dimensional Nanomaterials: Towards Controllable Scaling of the van der Waals Interaction
Alberto Ambrosetti, Pier Luigi Silvestrelli*
Università degli Studi di Padova, Department of Physics and Astronomy, Via Marzolo 8, 35131 Padova, Italy; D

18:15 II-3_26/O
Local high-temperature superconductivity in lanthanum cuprate heterostructures induced by space-charge effects
Federico Baiutti, Gennady Logvenov, Giuliano Gregori, Yi Wang, Peter van Aken, Joachim Maier*
Max-Planck Institute for Solid State Research, Department of Physical Chemistry of Solids, 70569 Stuttgart (Germany)

II-4 – IONICS OF MEMRISTOR/RESISTIVE SWITCHES

B. Fiore di Botta

Room B3

II-4/7

Chairman: Joshua Yang

11:00 II-4_24/I
Emergent Iontronics
*Yoshihiro Iwasa**
QPEC & Department of Applied Physics, University of Tokyo, Tokyo 113-8656, Japan, RIKEN Center for Emergent Matter Science, Wako 351-0198, Japan

11:25 II-4_25/I
Uncovering switching and failure mechanism in memristive devices by *operando* spectromicroscopy
Christoph Baeumer[(a)], David Cooper[(b)], Christoph Schmitz[(a)], Stephan Menzel[(a)], Claus Michael Schneider[(a)], Rainer Waser[(a)] and Regina Dittmann[(a)]*
[a] Peter Gruenberg Institute, Forschungszentrum Juelich GmbH, 52428 Juelich, Germany [b] Université Grenoble Alpes & CEA, LETI, Minatec Campus, 38054 Grenoble, France

11:50 II-4_26/O
Redox reactions in ReRAMs – The importance of moisture in VCM systems
Michael Lübben[(a)], Stefan Wiefels[(a,b)] and Ilia Valov[(c)]*
[a] Institut für Werkstoffe der Elektrotechnik II, RWTH Aachen University, Sommerfeldstr. 18/24 52074 Aachen, Germany. [b] Infineon Technologies Dresden GmbH, Königsbrücker Straße 180, 01099 Dresden, Germany [c] Peter-Grünberg Institut 7, Forschungszentrum Jülich, 52425 Jülich, Germany.

12:10 LUNCH

II-4/8

Chairman: Joshua Yang

14:20 II-4_27/I
IoT Applications Using ReRAM and Nanogap Memory
Yasuhisa Naitoh, Hisashi Shima, and Hiroyuki Akinaga*
Nanoelectronics Research Institute (NeRI), National Institute of Advanced Industrial Science and Technology (AIST), Higashi 1-1-1, Tsukuba, Ibaraki 305-8565, Japan, AIST-UTokyo Advanced Operando-Measurement Technology Open Innovation Laboratory (OPERANDO-OIL), National Institute of Advanced Industrial Science and Technology (AIST), Kashiwanoha 5-1-5, Kashiwa, Tiba 277-8568, Japan

14:45 II-4_28/I
Diffusive memristor as a building block for a novel true random number generator
*Hao Jiang[1], Daniel Belkin[2], Sergey E. Savel'ev[3], Siyan Lin[1], Zhongrui Wang[1], Yunning Li[1], Saumil Joshi[1], Rivu Midya[1], Can Li[1], Mark Barnell[4], Qing Wu[4], J. Joshua Yang[1], and Qiangfei Xia[1]**
[1] Department of Electrical and Computer Engineering, University of Massachusetts, Amherst, Massachusetts 01003, USA [2] Swarthmore College, Pennsylvania 19081, USA [3] Department of Physics, Loughborough University, Loughborough LE11 3TU, UK [4] Air Force Research Lab, Information Directorate, Rome, New York 13441, USA*

15:10 II-4_29/O

Role of the electrodes on the electrical characteristics of La_2NiO_4-based memristive devices

K. Maas[a], M. Boudard[a], Q. Rafhay[b], J.M. Caicedo[c], C. Jimenez[a], S. Bagdzevicius[a], J. Santiso[c], and M. Burriel[a]*

[a] Univ. Grenoble Alpes, CNRS, LMGP, F-38000 Grenoble, France [b] Univ. Grenoble Alpes, CNRS, IMEP-LAHC, F-38000 Grenoble, France [c] Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and The Barcelona Institute of Science and Technology (BIST), Campus UAB, 08913 Bellaterra, Barcelona, Spain

15:30 II-4_30/O

$LaMnO_{3+\delta}$: A candidate for new Resistive Switching Memories

D. Pla[a], O. Chaix-Pluchery[a], R. Rodriguez-Lamas[a], H. Roussel[a], M. Boudard[a], C. Jimenez[a] and M. Burriel[a]

[a] Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, F38000 Grenoble, France

15:50 BREAK

MACRO AREA 3: IONICS IN BIOLOGICAL SYSTEMS AND LIFE SCIENCES

III-1 – IONICS MEETS BIOSCIENCE

B. Fiore di Botta

Room B8

III-1/3

Chairman: Luisa Torsi

16:15 III-1_10/I

Fabrication and Modelling of Organic Electrochemical Transistors Printed on Plastic Foil

*Fabrizio Torricelli**

Department of Information Engineering, University of Brescia, via Branze 38, 25123 Brescia, Italy

16:40 III-1_11/I

Roll-to-Roll Pilot Line for Large-Scale Manufacturing of Microfluidic Devices

*A. Haase [a], U. Palfinger [a], D. Nees [a], L. Lasave [a], L. Kuna [a], M. Smolka [a], F. Hasenöhrl [b], A. Rodriguez [b], M. Sonnleitner [c], J. Kafka [d], G. Kofod [d], I. Ramos [e], M. Lohse [f], M. Thesen [f], N. Briz [g], A. Ayerdi [g], S. Köstler [a] and B. Stadlober**

[a] Institute for Surface Technologies and Photonics, JOANNEUM RESEARCH Forschungsgesellschaft mbH, 8160 Weiz, Austria [b] bionic surface technologies GmbH, 8010 Graz, Austria [c] Genspeed Biotech GmbH, 4261 Rainbach, Austria [d] InMold BioSystems AS, 2800 Kongens Lyngby, Denmark [e] Innoprot S. L, 48160 Derio, Spain [f] microresist technologies GmbH, 12555 Berlin, Germany [g] Tecnalia Research and Innovation, 20009 Donostia, San Sebastian, Spain

17:05 III-1_12/O

Organic bioelectronics probing conformational changes in surface confined proteins

Eleonora Macchia,[1] Domenico Alberga,[2] Kyriaki Manoli,[1] Giuseppe F. Mangiatordi,[3] Gerardo Palazzo,[1] Luisa Torsi[1]

[1] Dipartimento di Chimica, Università degli Studi di Bari *Aldo Moro* - Bari (Italy) [2] Dipartimento Interateneo di Fisica "M. Merlin" dell'Università e del Politecnico di Bari and INFN - Bari (Italy) [3] Dipartimento di Farmacia – Scienze del Farmaco, Università degli Studi di Bari *Aldo Moro* - Bari (Italy)

17:25 III-1_13/O

Understanding the stability of FBI-OFET devices modified with electrosynthesized ZnO nanoparticles

Rosaria Anna Picca, Maria Chiara Sportelli, Kyriaki Manoli, Gerardo Palazzo, Luisa Torsi, Nicola Cioffi*

Chemistry Department, University of Bari "Aldo Moro", Via Orabona 4, 70126 Bari, Italy

MACRO AREA 4: GENERAL ASPECTS, FUNDAMENTALS AND THEORY IN ION-CONDUCTING MATERIALS

IV-3 – INTERFACIAL PROCESSES AND NANOIONICS

B. Fiore di Botta

Room B5

IV-3/5

Chairman: Shu Yamaguchi

11:00 IV-3_17/K

Grain Boundaries and Interfaces in Ni-doped Proton Conducting Oxide Electrolytes and in Ni-based Cermet Anodes

Ryan O'Hayre[a], Daniel Clark[b], Chuancheng Duan[a], Sandrine Ricote[c], David Diercks[a], Brian Gorman[a], Huayang Zhu[c], Robert Kee[c]*

a) Metallurgical and Materials Engineering, Colorado School of Mines, USA b) University of Oslo, Norway c) Mechanical Engineering, Colorado School of Mines, USA

11:30 IV-3_18/I

Defect segregation and space-charge effects at oxide surfaces

*Tor S. Bjørheim[a, *], Eugene Kotomin[b] and Joachim Maier[b]*

[a] Centre for Materials Science and Nanotechnology, Department of Chemistry, University of Oslo, Norway, Gaustadalleen 21, 0349, Oslo. [b] Max-Planck Institute for Solid State Research, Heisenbergstrasse 1, Stuttgart, Germany.

11:55 IV-3_19/O

Differences in space charge formation at grain boundaries in $BaZrO_3$ and $BaCeO_3$

*Edit E. Helgee, Anders Lindman and Göran Wahnström**

Department of Physics, Chalmers University of Technology, SE-412 96 Göteborg, Sweden

12:15 LUNCH

IV-3/6

Chairman: Tor Bjørheim

14:20 IV-3_20/I

Oxide Surface Protonics: Proton Activity on Hydrated Oxide Surface

*Shu Yamaguchi**

Univ. of Tokyo, Dept. of Mater. Engg., 7-3-1 Hongo, Bunkyo-Ku, Tokyo 113-8656, Japan

14:45 IV-3_21/O

The Role of Grain Boundaries in Surface Protonics

*Sindre Ø. Stub [a], Einar Vøllestad[a], Per Martin Rørvik [b] and Truls Norby[a]**

[a] University of Oslo, Department of Chemistry, Gaustadalléen 21, NO-0349 Oslo, Norway [b] SINTEF Materials and Chemistry, NO-0314 Oslo, Norway

15:05 IV-3_22/O

First-principles based quantification of charged species redistribution at electrochemical interfaces: Model system of zirconium oxide

*Jing Yang[a], Mostafa, Youssef[a], Bilge Yildiz[a][b]**

[a] Laboratory for Electrochemical Interfaces, Department of Materials Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139, USA. [b] Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139, USA.

15:25 IV-3_23/O
Proton conduction in bulk water along grain boundary cavity of nano-grained oxides
Ryuhei Sato[a], Yasuaki Akao[a], Shogo Miyoshi[b], Shu Yamaguchi[a]*
(a) Department of Materials Engineering, The University of Tokyo 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, Japan (b) National Institute for Materials Science, 1-1 Namiki, Tsukuba, Ibaraki, 305-0044, JAPAN

IV-4 – POINT DEFECT CHEMISTRY OF OXIDE MATERIALS

A. Padova Fiere

Room A3

IV-4/5

Chairmen: Roger De Souza, Ashok Kumar Baral

11:00 IV-4_17/I
Perovskites with mixed protonic, oxygen vacancy and electronic conductivity: bulk defect chemistry and transport properties
Rotraut Merkle[a], Reihaneh Zohourian[a], Joachim Maier[a]*
[a]Max Planck Institute for Solid State Research, Stuttgart, Germany

11:25 IV-4_18/I
$BaFeO_{3-\delta}$-based Materials for Intermediate-Temperature Solid Oxide Fuel Cells and beyond
*Francesco Ciucci[a, b]**
[a] The Hong Kong University of Science and Technology, Mechanical and Aerospace Engineering, Clearwater Bay, Kowloon, Hong Kong, China SAR [b] The Hong Kong University of Science and Technology, Chemical and Biomolecular Engineering, Clearwater Bay, Kowloon, Hong Kong, China SAR

11:50 IV-4_19/O
Understanding Raman spectra of $SrTi_{1-x}Fe_xO_{3-\delta}$ Solid Solutions: Structural Symmetry Breaks and Defect Chemistry
E. Sediva[a], [b], F. Messerschmitt [a], [b], and J. L. M. Rupp [a], [b]*
[a] Electrochemical Materials, ETH Zurich, Hönggerbergring 64, 8093 Zurich, Switzerland [b] Department of Materials Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge, MA, 02139, USA

12:10 IV-4_20/O
Defect Chemistry and High–Temperature Transport in $SrFe_{1-x}Sn_xO_{3-x}$
Oleg Merkulov [a], Ruslan Samigullin[b], Alexey Markov[a], Ilya Leonidov[a], Mikhail Patrakeev[a]*
[a] Institute of Solid State Chemistry, UB RAS, Pervomayskaya Str., 91, Yekaterinburg, 620990 Russia [b] Ural Federal University, Mira Str. 19, Ekaterinburg, 620990 Russia

12:30 IV-4_21/O
Relating the defect chemistry and electrical properties of rare-earth double perovskites
Einar Vøllestad [a], Ragnar Strandbakke[a], Matthias Schrade[b] and Truls Norby[a]*
[a] University of Oslo, Department of Chemistry, Gaustadalléen 21, NO-0349 Oslo, Norway [b] University of Oslo, Department of Physics, Gaustadalléen 21, NO-0349 Oslo, Norway

12:50 LUNCH

IV-4/6

Special session: Ilan Riess' 75th anniversary

Chairman: Igor Lubomirsky

14:20 IV-4_22/I
Defect Chemistry and Driving Forces
*Joachim Maier**
Max Planck Institute for Solid State Research, Stuttgart, Germany

14:45 IV-4_23/O
Flash sintering and its puzzling relation to defects
Yoed Tsur[a, b], Neta Shomrat[a], Sioma Baltianski[b]*
[a] The Nancy and Stephen Grand Technion Energy Program, Technion – Israel Institute of Technology, Haifa 3200003 [b] Department of Chemical Engineering, Technion - Israel Institute of Technology, Haifa, Israel 3200003

15:05 IV-4_24/I
Mass and Charge Transport in the Vicinity of Interfaces
*Harry L. Tuller[a, b], **
[a] Massachusetts Institute of Technology, Department of Materials Science and Engineering, 77 Massachusetts Avenue, Cambridge, MA 02139 USA [b] International Institute of Carbon Neutral Energy Research (I²CNER), Kyushu University,

15:30 IV-4_25/I
Metal|MIEC|Metal devices – a review
*Ilan Riess**
Physics Department, TechnionIIT, Haifa, 3200003, Israel

15:55 BREAK

Joint Session

Chairmen: Yoed Tsur, Nini Pryds, Peter Crozier

16:15 IV-4_26/K
Beyond electrostatic effects at oxide hetero-interfaces: Electrochemical phase change, strong electric fields, and elastic strain
*Qiyang Lu[a], Mostafa Youssef[a, b], Jing Yang[a], Sean Bishop[a], Dongkyou Lee[c], Hendrik Bluhm[d], Ho Nyung Lee[c], Krystyn Van Vliet[a], Harry Tuller[a], and Bilge Yildiz[a, b]**
[a] Dept. of Materials Sci. and Engineering, [b] Dept. of Nuclear Science and Engineering, Massachusetts Institute of Technology [c] Materials Science and Technology Division, Oak Ridge National Laboratory [d] Chemical Sciences Division, Lawrence Berkeley National Laboratory

16:45 IV-4_27/I
The surface space-charge layer in oxides: detection, description and consequences
*Roger A.de Souza**
[a] Institute of Physical Chemistry, RWTH Aachen University, Landoltweg 2, 52062 Aachen, Germany

17:10 II-1_19/I
Influence of strain on the oxygen ion and proton conductivity of thin films
*T. Lippert[1], [2], *, A. Fluri[1], D. Pergolesi[1], A. Wokaun[1], N. Marzari[3], A. Marcolongo[3], V. Roddatis[4]*
[1] Thin Films & Interfaces Group, Research with Neutrons and Muons Division, Paul Scherrer Institut, 5232 Villigen-PSI. Switzerland [2] Laboratory of Inorganic Chemistry, ETH Zurich, Vladimir Prelog Weg 1, 8093 Zurich, Switzerland [3] Theory and Simulations of Materials (THEOS), and National Centre for Computational Design and Discovery of Novel Materials (MARVEL), École Polytechnique Fédérale de Lausanne, Station 12, 1015 Lausanne, Switzerland. [4] Institut für Materialphysik, Universität Göttingen, Friedrich-Hund-Platz 1, Göttingen 37077, Germany.

17:35 II-1_20/I
X-ray Studies of Oxygen Vacancy Behavior in Complex Oxide Heterostructures
*Dillon D. Fong**
Argonne National Laboratory, Materials Science Division, 9700 S. Cass Ave., Bldg 241/A164, Argonne, Illinois 60439, USA

IV-7 – NUCLEAR MAGNETIC RESONANCE IN SOLID STATE IONICS

A. Padova Fiere

Room A4

IV-7/1

Chairman: Steve Greenbaum

16:15 IV-7_1/I
Ionic dynamics in solid electrolytes by means of Nuclear Magnetic Resonance Relaxometry
*Danuta Kruk**
University of Warmia & Mazury in Olsztyn, Faculty of Mathematics and Computer Science, Słoneczna 54, 10-710 Olsztyn, Poland

16:40 IV-7_2/I
Mobile Lithium Ions in Solids Probed via NMR Spin Relaxation
Paul Heitjans
Leibniz Universität Hannover, Institute of Physical Chemistry and Electrochemistry, Callinstr. 3-3a, 30167 Hannover, Germany

17:05 IV-7_3/I
The Usefulness of NMR Spin-Alignment Echoes to Probe Li Diffusion in Solids
*Martin Wilkening**
Graz University of Technology, Institute for Chemistry and Technology of Materials (NAWI Graz), Christian Doppler Laboratory for Lithium Batteries and DFG Research Unit 1277 'mobility of lithium ions in solids', Stremayrgasse 9, 8010 Graz, Austria.

17:30 IV-7_4/O
Local Structures and Li Ion Dynamics in $Li_{10}SnP_2S_{12}$ Observed by Multinuclear Solid-State NMR Spectroscopy and Relaxometry
Sylvio Indris, Maximilian Kaus, Heike Stöffler, Murat Yavuz, Michael Knapp, Helmut Ehrenberg*
Institute for Applied Materials – Energy Storage Systems (IAM-ESS), Karlsruhe Institute of Technology (KIT), Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany

17:50 IV-7_5/O
The local structural evolution and ion-conducting mechanism of electrode/electrolyte materials in Li^+/Na^+ -ion batteries
*D. W. Wang[1], X. H. Wu, R. Liu[1], G. M. Zhong[1], R. Q. Fu[2], Yong Yang[1]**
[1)] Collaborative Innovation Center of Chemistry for Energy Materials, State Key Lab of Physical Chemistry of Solid Surface and Department of Chemistry, College of Chemistry and Chemical Engineering, Xiamen University, Xiamen 361005, China; [2)] National High Magnetic Field Laboratory, 1800 E. Paul Dirac Drive, Tallahassee, Florida 32310, USA.

A. Padova Fiere

P area

POSTER SESSION 2 (S2)

Chairmen: Harry L. Tuller, Vito Di Noto

18:20 - 20:00 Poster Session 2

ORAL PRESENTATIONS

FRIDAY June 23, 2017

MACRO AREA 1: IONICS IN ENERGY AND ENVIRONMENT

I-2 – ADVANCED LITHIUM AND SODIUM BATTERY ELECTRODE MATERIALS

B. Fiore di Botta

Room B7

I-2/17

Chairmen: Youngsik Kim, Craig Fisher

8:00 I-2_70/I
High Capacity Cathode Concepts for Li-Sulphur Batteries
Aleksandar Matic[(a)], Florian Nitze[(a)], Du-Hyun Lim[(a)], Marco Agostini[(a)], Filippa Lundin[(a)], and Anders Plamqvist[(b)]
[(a)] Chalmers University of Technology, Department of Physics, 41296 Göteborg, Sweden. [(b)] Chalmers University of Technology, Department of Chemistry and Chemical Engineering, 41296 Göteborg, Sweden.

8:25 I-2_71/O
Moving to high energy and sustainable Li-Sulfur batteries
Marco Agostini and Aleksandar Matic
Department of Applied Physics, Chalmers University of Technology, S41296 Göteborg, Sweden.

8:45 I-2_72/O
The effect of dissolved oxygen in ether-based electrolytes for Li-S
Lucas Lodovico, Alberto Varzi, and Stefano Passerini
Helmholtz Institute Ulm, Helmholtzstraße 11, 89081, Ulm, Germany
Karlsruhe Institute of Technology, P.O. Box 3640, D-76021 Karlsruhe, Germany.

9:05 I-2_73/O
MCMB/Mn_3O_4 based anode materials for Li-ion Storage Applications
V.S. Pradeep[a,b], B. Jinisha[a,b], K.M. Anil Kumar[a,b], and S. Jayalekshmi[a,b]
[(a)] Department of Physics, Cochin University of Science and Technology, Cochin 682022. [(b)] Center of Excellence in Advanced Materials, Cochin University of Science and Technology, Cochin 682022.

9:25 I-2_74/O
Anodic Materials for Lithium-Ion Batteries: TIO_2-rGO Composites for High Power Application
Daniele Versaci[a], Marco Minella[b], Claudio Minero[b], Carlotta Francia[a], Silvia Bodoardo[a], Nerino Penazzi[a]
[(a)] Electrochemistry group, DISAT Polytechnic of Turin, corso Duca degli Abruzzi 24, Turin, Italy. [(b)] Department of Chemistry and NIS Inter-departmental Centre, University of Torino, via P. Giuria 5, Torino,10125, Italy.

9:45 I-2_75/O
Synthesis of carbon materials for anode of lithium-ion battery by using Metal Organic Frameworks as self-templates
Eiji Hosono[(a)], Yuki Makinose[(a)], Omar S. Mendoza-Hernandez[(b)], Yoshitsugu Sone[(b)], Minoru Umeda[(c)], Daisuke Asakura[(a)], Hirofumi Matsuda[(a)]
[(a)] National Institute of Advanced Industrial Science and Technology (AIST), Research Institute for Energy Conservation, 1-1-1 Umezono, Tsukuba, Ibaraki 305-8568, Japan. [(b)] Japan Aerospace Exploration Agency (JAXA), *Institute of Space and Astronautical* Science, 3-1-1 Yoshinodai, Chuo-ku, Sagamihara, Kanagawa 252-5210, Japan. [(c)]Nagaoka University of Technology, Department of Materials Science and Technology, Kamitomioka 1603-1, Nagaoka, Niigata 940-2188, Japan.

10:05 I-2_76/O
Dandelion-Like Mesoporous SiO_x as High-Rate and Long-Life Anode Material for Lithium-Ion Batteries
Zhaolin Li[a], Hailei Zhao[a,b], Boyang Fu[a], Zijia Zhang[a], Lina Zhao[a]
[a] University of Science and Technology Beijing, School of Materials Science and Engineering, Beijing 100083, China. [b] Beijing Municipal Key Laboratory of New Energy Materials and Technologies, Beijing 100083, China.

10:25 BREAK

I-2/18

Chairmen: Youngsik Kim, Craig Fisher

11:00 I-2_77/O
A symmetric twist boundary in spinel $LiMn_2O_4$ and its influence on battery properties
Hiroki Moriwake[a, b], Craig A.J. Fisher[a], Yumi H. Ikuhara[a], Shunsuke Kobayashi[a], Akihide Kuwabara[a, b], Xiaobing Hu[a], Yoshio Ukyo[c], Yuichi Ikuhara[a, d]
[a] Nanostructures Research Laboratory, Japan Fine Ceramics Center, Nagoya, 456-8587, Japan. [b] Center for Materials research by Information Integration (CMI2), National Institute for Materials Science (NIMS), Tsukuba, Ibaraki 305-0047, Japan. [c] Kyoto University, Uji, Kyoto 611-0011, Japan. [d]Institute of Engineering Innovation, The University of Tokyo, Tokyo 113-8586, Japan.

11:20 I-2_78/O
3D Dendrite-free Lithium Metal Anode in a Foam Host
Li-Zhen Fan[a], Shang-Sen Chi[a],Yongchang Liu[a], Qiang Zhang[b]
[a] Institute of Advanced Materials and Technology, University of Science and Technology Beijing, Beijing 100083, China. [b] Beijing Key Laboratory of Green Chemical Reaction Engineering and Technology, Department of Chemical Engineering, Tsinghua University, Beijing 100084, China.

11:40 BREAK

I-3 – ALL SOLID-STATE BATTERIES

B. Fiore di Botta

Room B1

I-3/18

Chairmen: Ainara Aguadero, Randy Jalam

8:00 I-3_81/I
Towards All Solid State Batteries Using Oxide Solid Electrolytes
Laurence Groleau, Marie Lachal, Thomas Bibienne, Mickael Dollé
Université de Montréal, Department of Chemistry, Montreal, Quebec, Canada.

8:25 I-3_82/I
In situ electrochemically solidified interface in metal lithium batteries
Jie Huang[a], Wenjun Li[a], Qi Yang[a], Jiayue Peng[a], Jieyun Zheng[a], Hong Li[a,b]
[a] Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing, 100190, P. R. China. [b] University of Chinese Academy of Sciences, Beijing, 100190, P. R. China.

8:50 I-3_83/O
Li_6PS_5Cl as Solid Electrolyte in "All-Solid-State" Batteries: Interface Stability towards Cathode Materials
Jérémie Auvergniot[a,b], Alice Cassel[b], Dominique Foix[a,c], Virginie Viallet[b,c], Vincent Seznec[b,c], Rémi Dedryvère[a,c]
[a] IPREM, CNRS – Université de Pau et des Pays de l'Adour, 2 Avenue Pierre Angot, 64053 Pau Cedex 9, France. [b] LRCS, CNRS – Université de Picardie Jules Verne, 33 Rue Saint Leu, 80039 Amiens Cedex, France. [c] Réseau sur le Stockage Electrochimique de l'Energie (RS2E), FR CNRS 3459, France.

9:10 I-3_84/O
Preparation of composite cathode with high content of active material for all-solid-state battery using Li_6PS_5Cl precursor solution containing ethyl-cellulose as binder
Nataly Carolina Rosero-Navarro, Taiki Kinoshita, Akira Miura, Mikio Higuchi and Kiyoharu Tadanaga
Hokkaido University, Faculty of Engineering, Sapporo 060-8628, Japan.

9:30 I-3_85/O
***Operando* X-ray absorption spectroscopic analysis of reactions and the design of high rate capability cathode for all-solid-state lithium-ion batteries**
Yoshiharu Uchimoto[a], Kentaro Yamamoto[a], Atsushi Sakuda[b], Yuki Orikasa[c], Akitoshi Hayashi[d], Yuta Kimura[c], Takashi Nakamura[c], Koji Amezawa[c] , Masahiro Tatsumisago[d]
[a] Graduate School of Human and Environmental Studies, Kyoto University, Yoshida, Sakyo, Kyoto 606-8501, Japan. [b] Research Institute of Electrochemical Energy, National Institute of Advanced Industrial Science and Technology (AIST), 1-8-31, Midorigaoka, Ikeda, Osaka 563-8533, Japan. [c] Department of Applied Chemistry, Ritsumeikan University, 1-1-1, Noji-Higashi, Kusatsu, Shiga 525-8577, Japan. [d] Graduate School of Engineering, Osaka Prefecture University, 1-1 Gakuencho, Naka, Sakai, Osaka 599-8531, Japan. [c] Institute of Multidisciplinary Reseaech for Advanced Materials (IMRAM), Tohoku University, 2-1-1, Katahira, Aoba-ku, Sendai 980-8577, Japan.

9:50 I-3_86/O
Improvement of Grain-Boundary Resistance for Li-Ion Conductive Oxide by Spark-Plasma Sintering
Toyoki Okumura, Tomonari Takeuchi, Hironori Kobayashi
Research Institute of Electrochemical Energy, National Institute of Advanced Industrial Science and Technology (AIST), 1-8-31 Midorigaoka, Ikeda, Osaka 563-8577, Japan.

10:10 I-3_87/O
Nanoconfined complex hydrides as fast ionic conductors for batteries
Peter Ngene[a], Sander Lambregts[a], Didier Blanchard[b], Tejs Vegge[b], Arno P. M. Kentgens[c], and Petra E. de Jongh[a] **
[a]Inorganic Chemistry and Catalysis, Debye Institute for Nanomaterials Science, Utrecht University, The Netherlands; [b]Department of Energy Conversion and Storage, Technical University of Denmark, Roskilde, Denmark [c]Institute for Molecules & Materials, Radboud University, Nijmegen, The Netherlands

10:30 BREAK

I-4 – IONICS IN "OPEN" BATTERIES (REDOX FLOW BATTERIES)

B. Fiore di Botta

Room B3

I-4/5

Chairman: Thomas Zawodzinski

8:35 I-4_18/I
Membrane Evaluation, Modelling and Simulation in Vanadium Redox Flow Batteries
*Liuyue Cao and Maria Skyllas-Kazacos**
School of Chemical Engineering, UNSW Sydney, Australia, 2052.

9:00 I-4_19/I
Properties of Carbon and of the Electrolyte in All-Vanadium RFBs
Jochen Friedl[a], Matthäa Schwob[a] and Ulrich Stimming[a,b],*
[a]School of Chemistry, Bedson Building, Newcastle University, Newcastle upon Tyne, NE1 7RU, United Kingdom. [b]Electrochemical Research Group, Institute of Informatics VI, Technical University of Munich, Schleißheimerstraße 90a, 85748 Garching, Germany.

9:25 I-4_20/I
The investigation on the preparation and performance of highly selective and conductive porous ion conducting membranes for vanadium flow battery

Wenjing Lu[a,b], Xianfeng Li[a,c], Huamin Zhang[a,c]**

[a] Dalian Institute of Chemical Physics, Chinese Academy of Sciences,Institution, Division of Energy Storage, 457 Zhongshan Road, Dalian 116023, China. [b] Graduate School of Chinese Academy of Sciences, Beijing 100039, China. (c) Collaborative Innovation Center of Chemistry for Energy Materials (iChEM), Dalian 116023, China.

9:50 I-4_21/I
Electrospun Nafion/PVDF Single-fiber Blended Membranes for Regenerative H_2/Br_2 Fuel Cells

Jun Woo Park[a], Ryszard Wycisk[a], Guangyu Lin[b] Devon Powers[a], Trung Van Nguyen[c], Regis Dowd[c], and Peter N. Pintauro[a]

[a]Department of Chemical and Biomolecular Engineering, Vanderbilt University, Nashville, TN, 37235, USA. [b]TVN Systems, Inc., Lawrence, KS 66046, USA. [c]Department of Chemical & Petroleum Engineering, The University of Kansas, Lawrence, KS, 66045, USA.

10:15 I-4_22/O
Searching for New Redox-Complexes for Organic Flow Batteries

S. Caramori[1], E. Benazzi[1], V.Cristino[1], C.A. Bignozzi[1], Laura Meda[2], F. Oldani[2], G. Tozzola[2]*

[a]Dept. Chemical and Pharmaceutical Sciences, Univ. Ferrara, Italy. [b]Renewable Energy and Environmental R&D Center, ENI Novara, Italy.

10:35 BREAK

I-5 – POLYMER ELECTROLYTE IONOMERS: ADVANCES IN CATION- AND ANION-EXCHANGE MEMBRANES AND ION CONDUCTION

B. Fiore di Botta

Room B9

I-5/6

Chairman: Peter Pintauro

9:10 I-5_22/O
Thallium Chemical Sensors For Environmental Monitoring Based On Mixed Ion Conducting Chalcogenide Glasses

Alla Paraskiva[a], Maria Bokova[a], Mariana Milochova[a], Igor Alekseev[b], Eugene Bychkov[a]**

[a]Université du Littoral Côte d'Opale, 59240 Dunkerque, France. [b] V. G. Khlopin Radium Institute, 194021 St. Petersburg, Russia.

9:30 I-5_23/O
Properties of Anion Exchange Membrane Based on Polyamine: Effect of Functionalized Silica Particles Prepared by Sol–gel Method

Narges Ataollahi[a], Fabrizio Girardi[a], Keti Vezzù[b], Vito Di Noto[b,c], Paolo Scardi[a], Emanuela Callone[d], Sandra Dire [d], Rosa Di Maggio[a]*

[a]Department of Civil, Environmental and Mechanical Engineering, University of Trento, Via Mesiano 77, 38123, Trento, Italy. [b]Section of Chemistry for Technology, Department of Industrial Engineering, University of Padova, Via Marzolo 9, 35131 Padova, Italy. [c] Institute of Condensed Matter Chemistry and Technologies for Energy (CNR-ICMATE), Via Marzolo 1, 35131 Padova (PD), Italy. [d]Department of Industrial Engineering, University of Trento, Via Sommarive 9, 38123 Trento, Italy.

9:50 I-5_24/O
Sulfonated and partially fluorinated poly(aryl) multiblock-co-ionomer- and blend-membranes as proton-conducting material

Johannes Bender, Birgit Salzmann, Jochen Kerres*
University of Stuttgart – Institute of Chemical Process Engineering, Böblinger Str. 78, 70199 Stuttgart, Germany.

10:10 I-5_25/O
Composite Anionic Exchange Membrane with Bacterial Cellulose and Cross-Linked Poly(3-acrylamidopropyl) Trimethylammonium Hydroxide

*Nuno Sousa[a], Carla Vilela[b], Carmen Freire[b], Armando Silvestre[b], Filipe Figueiredo[a]**

[a] Dep. of Materials & Ceramic Engineering, CICECO, University of Aveiro, 3810-193 Aveiro, Portugal. [b] Dep. of Chemistry, CICECO, University of Aveiro, 3810-193 Aveiro, Portugal.

10:30 BREAK

I-5/7

Chairman: Michael Hickner

11:00 I-5_26/O
Preparation and Properties of Proton Exchange Membranes Synthesized via Single-step Grafting PSSA onto PVDF Modified by TMAH

*GUO Guibao[a], AN Shengli[b]**

[a] School of Chemistry and Chemical Engineering, Inner Mongolia University of Science and Technology, Baotou 014010, P. R. China. [b] School of Material and Metallurgy, Inner Mongolia University of Science and Technology, Baotou 014010, P. R. China).

11:20 I-5_27/O
First-principles molecular dynamics simulations study on proton transport in membranes for fuel cell applications

Yoong-Kee Choe
Research Center for Computational Design of Advanced Functional Materials (CD-FMat), National Institute of Advanced Industrial Science and Technology, Umozono 1-1-1, Tsukuba 3058568 Japan.

11:40 BREAK

I-6 – HIGH-TEMPERATURE PROTON-CONDUCTING POLYMER MEMBRANES

B. Fiore di Botta

Room B10

I-6/2

Chairman: Andrew Herring

8:00 I-6_6/K
Why do proton conducting poly-benzimidazole phosphoric acid membranes perform well in high-temperature PEM fuel cells?

Klaus-Dieter Kreuer
Max-Planck-Institute for Solid State Research, Heisenbergstr. 1, 70560 Stuttgart, Germany.

8:30 I-6_7/I
Exploring structure and ion transport in polybenzimidazole-based high-temperature fuel cells: towards operando experiments

Oxana Ivanova
Jülich Centre for Neutron Science (JCNS) at Heinz Maier-Leibnitz Zentrum (MLZ), Forschungszentrum Jülich GmbH, Lichtenbergstr. 1, 85748 Garching, Germany

8:55 I-6_8/I
PBI-based membranes for High Temperature Polymer Electrolyte Fuel Cells

Eliana Quartarone
Department of Chemistry and INSTM, University of Pavia, Via Taramelli 16, 27100 Pavia, Italy

9:20 I-6_9/I
Membrane Development for HT PEMFC

Dirk Henkensmeier[a], Mateusz Brela[b], Ngoc My Hanh Duong[a], Karol Dyduch[b], Steffen Hink[a], Dickson Joseph[a], N. Nambi Krishnan[a], Artur Michalak[b], Bhupendra Singh[a].*

[a] Fuel Cell Research Center, KIST, Hwarangno 14gil5, Seongbukgu, 02792 Seoul, Korea. [b] Jagiellonian University, Faculty of Chemistry, Ingardena 3, 30-060 Krakow, Poland.

9:45 I-6_10/I
Recent Developments in High-Temperature PEM Fuel Cells
Hans Aage Hjuler and Thomas Steenberg*
Danish Power Systems, Egeskovvej 6C, DK-3490 Kvistgaard, Denmark

10:10 I-6_11/I
Latest Results from the Projects H_3PO_4 and CISTEM
Nadine Pilinski, Maren Rastedt, Alexander Dyck and Peter Wagner
NEXT ENERGY · EWE Research Centre for Energy Technology at the University of Oldenburg, Carl-von-Ossietzky Str. 15, 26129 Oldenburg, Germany.

10:35 BREAK

I-6/3

Chairman: Piercarlo Mustarelli

11:00 I-6_12/O
Interaction of PBI-type Polymers with New Acidic Proton Conducting Ionic Liquids – Conductivity And ORR Kinetics
*Carsten Korte *, Klaus Wippermann , Jürgen Wackerl , Susanne Kuhri and Werner Lehnert*
Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung (IEK-3), D -52425 Jülich, Germany.

11:20 I-6_13/O
Water and Sodium Transport and Liquid Crystalline Alignment in a High Temperature Sulfonated Aramid Membrane
Theo Dingemans [a,b], Jianwei Gao [b], Ying Wang [c] and Louis A. Madsen [c]*
[a] University of North Carolina at Chapel Hill, Department of Applied Physical Sciences, Murray Hall 1113, 121 South Road, Chapel Hill, NC27599-3055, USA
[b] Delft University of Technology, Faculty of Aerospace Engineering, Kluyverweg 1, 2629 HS, Delft, The Netherlands. [b] Virginia Polytechnic Institute and State University, Department of Chemistry and Macromolecules and Interfaces Institute, Blacksburg, VA 24061, USA.

11:40 BREAK

I-7 – "POLYMER ELECTROLYTES" - THE UBIQUITY OF IONS AND POLYMER MATERIALS IN DEVICES

B. Fiore di Botta

Room B9

I-7/9

Chairman: Maria Forsyth

8:15 I-7_35/I
Efficient Fluoride Anion Sensing Utilizing Boron/Silicon Dual Hetero-elements Type Inorganic Copolymers
Noriyoshi Matsumi, Raman Vedarajan, Puhup Puneet*
School of Materials Science, Japan Advanced Institute of Science and Technology.

8:40 I-7_36/O
Solid-liquid glyme based electrolytes for lithium batteries
Maryam Nojabaee, Jelena Popovic, Joachim Maier*
Max Planck Institute for Solid State Research, Stuttgart, Germany.

9:00 I-7_37/O
Strategy to induce stable antistatic effect on polyethylene
*Akiko Tsurumaki [a], Maria Assunta Navarra [a], Hiroyuki Ohno [b], and Stefania Panero [a]**
[a] Dept. Chemistry, Sapienza University of Rome, Piazzale Aldo Moro 5, 00185 Rome, Italy. [b] Functional Ionic Liquid Laboratories and Dept. Biotechnology, Tokyo University of Agriculture and Technology, 2-24-16 Naka-cho, Koganei, Tokyo 184-8588, Japan.

9:20 I-7_38/O
Development and characterization of proton conducting polymer electrolyte based on PVA:Arginine: NH_4SCN
*R. Bhuvaneswari [a, b, c], S. Karthikeyan [d], S. Selvasekarapandian [c]**
[a] Vel Tech Dr. RR & Dr. SR Technical University, Avadi, Chennai, India [b] Research and Development Centre, Bharathiar University, Coimbatore, Tamilnadu, India [c]Materials Research Centre, Coimbatore, Tamilnadu, India. [d] Department of Physics, Madras Christian College, Tambaram, Chennai, India.

9:40 I-7-39/O
A New Glass Forming Electrolyte Based on Lithium Glycerolate
*Federico Bertasi [a], Sara Tonello [a], Gioele Pagot [a, b], Keti Vezzù [a], Vito Di Noto *[a, b]*
[a] Section of Chemistry for Technology, Department of Industrial Engineering, University of Padova, Via Marzolo 9, 35131 Padova, Italy. [b] Centro Studi di Economia e Tecnica dell'Energia "Giorgio Levi Cases", Via Marzolo 9, 35131 Padua, Italy.

10:00 I-7_40/O
Development of Solid Polymer Electrolytes Based on PEO Complexed with 2-trifluoromethyl-4, 5-dicyanoimidazole Lithium Salt and EMImTFSI Ionic Liquid for Lithium Batteries
*Anji Reddy Polu [a, b] * and Hee-Woo Rhee [b] **
[a] Department of Physics, Vardhaman College of Engineering, Kacharam, Shamshabad-501218, Hyderabad, Telangana, India
[b]Polymer Materials Lab, Department of Chemical and Biomolecular Engineering, Sogang University, 35 Baekbeom-Ro, Mapo-Gu, Seoul 121-742, South Korea.

10:20 I-7_41/O
A Novel Polyelectrolyte with ABC Triblock Copolymer Architecture for Stable Lithium Electro-deposition
*Kun-lin Liu [a], Chung-Hsiang Chao [b], Hsin-Chieh Lee [c], Cheng-Si Tsao [d], Jason Fang [e], Chi-yang Chao [f]**
[a] Department of Materials Science and Engineering, National Taiwan University, No. 1, Sec. 4, Roosevelt Road, Taipei, 10617 Taiwan(R.O.C.) [b] Industrial Technology Research Institute.195, Sec. 4, Chung Hsing Rd., Chutung, Hsinchu, Taiwan 31040, R.O.C. [c] Department of Materials Science and Engineering, National Taiwan University,No. 1, Sec. 4, Roosevelt Road, Taipei, 10617 Taiwan(R.O.C.). [d] Institute of Nuclear Energy Research, Atomic Energy Council 1000 Wenhua Rd. Jiaan Village, Longtan District, Taoyuan City 32546, Taiwan (ROC). [e] Industrial Technology Research Institute. 195, Sec. 4, Chung Hsing Rd., Chutung, Hsinchu, Taiwan 31040, R.O.C. [f] Department of Materials Science and Engineering, National Taiwan University, No. 1, Sec. 4, Roosevelt Road, Taipei, 10617 Taiwan(R.O.C.).

10:40 BREAK

I-9 – SOLID OXIDE FUEL CELLS AND ELECTROLYZERS

A. Padova Fiere

Room A2

I-9/17: **Cells and Electrolytes II**

Chairman: Kazunari Sasaki

8:00 I-9_82/O
High Performance Solid Oxide Fuel Cell with Hierarchically Structured Anode Prepared by Phase Inversion Tape Casting Method
*Tong Liu[a,b,c] *, Yao Wang[a,b], Cong Ren[b], Fanglin Chen[b]**
[a] School of Power and Mechanical Engineering, Wuhan University, Wuhan, Hubei 430072, China. [b] Department of Mechanical Engineering, University of South Carolina, Columbia, SC 29208, USA. (c) Suzhou Institute of Wuhan University, Suzhou, Jiangsu 215123, China.

8:20 I-9_83/O
Understanding the degradation of the microtubular solid oxide fuel cell – Longitudinal Raman and SEM study
Aneta Slodczyk[a], Marc Torrell Faro[a], Aitor Hornés[a], Alex Morata[a], Kevin Kendall[b], Albert Tarancón[a]*
[a] Catalonia Institute for Energy Research (IREC), Jardins de les Dones de Negre, 1, 08930 Sant Adrià de Besos, Barcelona, Spain. [b] Adelan, 112 Park Hill Road, Birmingham B17 9HD, UK.

8:40 I-9_84/O
Development of microtubular solid-oxide fuel cells with molybdenum-doped BSCF as a cathode
Daniel V. Maslennikov, Mikhail P. Popov, Elena V. Shubnikova, Alexander A. Matvienko, Alexander P. Nemudry*
Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia.

9:00 I-9_85/O
3D printed SOFC stacks
C. Willich[a], V. Esposito[b], C. Chaput[c], J. C. Ruiz-Morales[d], P. Gooden[e], F. Ramos[f], D. Lieftink[g], H. Hedlund[h], A. Morata[a], A. Tarancón[a]
[a] Catalonia Institute for Energy Research, Jardins de les Dones de Negre 1, 08930 Sant Adrià de Besòs, Barcelona, (Spain). [b]Technical University of Denmark, Frederiksborgvej 399, 4000 Roskilde (Denmark). [c] 3DCeram, Rue du Petit Theil 27, 87280 Limoges, France. [d] Department of Chemistry, University of La Laguna, Avda. Astrofísico Francisco Sánchez, 38200 Tenerife (Spain). [e] Promethean Particles Ltd, Genesis Park,Midland Way, Nottingham NG7 3EF (UK). [f] Francisco Alberto S.A.U, Rafael Barradas 19, 08908 Hospitalet, Barcelona (Spain). [g] HyGear Fuel Cell Systems B.V, Westervoortsedijk 73, 6827 AV Arnhem (Netherlands). [h]Saan Energi AB, Sölvegatan 41, 23370 Lund (Sweden).

9:20 I-9_86/O
One-step synthesis of LSCFN-GDC electrode for symmetric solid oxide fuel cell with carbon-based fuels
Na Xu[a], Zhibin Yang[a], Minfang Han[a,b]
[a] Union Research Center of Fuel Cell, School of Chemical and Environmental Engineering, China University of Mining and Technology, Beijing 100083, China. [b] State Key Laboratory of Power Systems, Department of Thermal Engineering, Tsinghua University, Beijing 100084, China.

9:40 I-9_87/O
Towards long-term stable solid state electrolyzers with infiltrated catalysts
Simona Ovtar, Ming Chen, Karen Brodersen, Anne Hauch, Xiufu Sun, Janet J. Bentzen,Peter V. Hendriksen*
Department of Energy Conversion and Storage, Technical University of Denmark, DK-4000 Roskilde, Denmark.

10:00 I-9_88/O
Sr and Zr transport in LSCF/GDC/single-crystal YSZ model heterostructures
Jeffrey C. De Vero[a], Katherine Develos-Bagarinao[b], Hirofumi Matsuda[a], Haruo Kishimoto[a], Tomohiro Ishiyama[a], Katsuhiko Yamaji[a], Teruhisa Horita[a], and Harumi Yokokawa[a,b]*
[a]Research Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology, Tsukuba, Ibaraki, Japan. [b] Institute of Industrial Science, The University of Tokyo, Tokyo, Japan.

10:20 BREAK

11:00 I-9_89/O
Diffusion phenomena at the CGO barrier layer processed by Pulsed Laser Deposition for Solid Oxide Fuel Cells
*Miguel Morales[a], Aneta Slodczyk[a], Arianna Pesce[c], Albert Tarancón[a], Marc Torrell[a], Jan Pieter Ouweltjes[b], Dario Montinaro[b], Alex Morata[a]**
[a] IREC, Catalonia Institute for Energy Research, Jardins de les Dones de Negre 1, 2º, Sant Adrià del Besós, Barcelona, 08930, Spain. [b] HTceramix SA, Avenue des Sports 26, Yverdon-les-Bains, CH-1400, Switzerland. [c]SOLIDPower SpA, Viale Trento 117, Mezzolombardo, 38017, Italy.

11:20 I-9_90/O
A FIB-STEM Study of $La_{0.8}Sr_{0.2}MnO_3$ cathode and Y_2O_3-ZrO_2 (LSM/YSZ) electrolyte interface in Solid Oxide Fuel Cells
Shuai He[a], Kongfa Chen[b], Martin Saunders[c] and San Ping Jiang[,a]*
[a]Fuels and Energy Technology Institute, Curtin University, Perth, WA 6102, Australia. [b]College of Materials Science and Engineering, Fuzhou University, Fuzhou, Fujian350108, China. [c]Centre for Microscopy, Characterisation and Analysis, The University of Western Australia, Perth, WA 6009, Australia.

11:40 BREAK

I-10 – MULTI-FUNCTIONAL OXIDE NANOMATERIALS: FROM DESIGN TO ADVANCED APPLICATIONS

B. Fiore di Botta

Room B6

I-10/14

Chairman: Ettore Fois

8:00 I-10_56/I
The role of simulation in the characterization of perfect and defective crystalline compounds
*Roberto Dovesi**
Torino University, Chemistry Department, Via Giuria, 5, Torino 10125 Italy.

8:25 I-10_57/O
Temperature induced formic acid-formate equilibrium on TiO_2 anatase (101) surfaces
Marco Fabbiani,[a]. Chiara Deiana,[b] Gianmario Martra,[b], Gloria Tabacchi[a]*
[a] Department of Science and High Technology – Università dell'Insubria, via Valleggio 11, 22100 Como, Italy. [b] Dipartimento di Chimica and Nanostructured Interfaces and Surfaces (NIS) Inter-departmental centre – Università degli Studi di Torino, Via P. Giuria 7, 10125 Torino, Italy.

8:45 I-10_58/O
Carbon monoxide and Formic acid at the surface of TiO_2-anatase nanoparticles: the relevance of thermal effects
Gloria Tabacchi[a], Chiara Deiana[b], Marco Fabbiani[a], Ettore Fois[a], Gianmario Martra[b], Stéphanie Narbey[c], Francesco Pellegrino[b]*
[a] University of Insubria and INSTM, Department of Science and High Technology, Como, Italy. [b] University of Turin, Department of Chemistry and NIS Centre, Torino, Italy. [c] Solaronix SA, Aubonne, Switzerland.

9:05 I-10_59/O
Photoinduced Charge Transfer Across ZnO-Organic Dye Interface
Nikolai V. Tkachenko[a], Hanna Hakola[a], Kirsi Vorkki[a], Viktoria Golovanova[b], Viacheslav Golovanov[b]*
[a] Laboratory of Chemistry and Bioengineering, Tamepre University of Technology, P. O. Box 541, FI-33101 Tampere, Finland. [b] South–Ukrainian University, Staroportofrankovskaya str. 26, 65020, Odessa, Ukraine.

9:25 I-10_60/O
Electro-Oxidation Of Phenol At High Temperature And Pressure
Andrea Massa, Simelys Hernández*, Nunzio Russo, Debora Fino*
Department of Applied Science and Technology, Politecnico di Torino, Dept. of Applied Science and Technology, Corso Duca degli Abruzzi 24, 10129 Torino, Italy.

9:45 I-10_61/O
Formation and Reactivity of Reduced Centers in Tetragonal Zirconia: Role of Supported Clusters and Nanostructuring
Sergio Tosoni, Antonio Ruiz Puigdollers, Gianfranco Pacchioni*
Università di Milano Bicocca, Dipartimento di Scienza dei Materiali, Via R. Cozzi 55, 20125 Milano, Italy.

10:05 I-10_62/O
Study of the electrochromic properties of MAPLE and PLD deposited WO_3 thin films
Stefan I. Boyadjiev[a,b], Nicolaie Stefan[c], George Stan[d], Miguel Arvizu[e], Imre M. Szilágyi[b,f], Anita Visan[c], Natalia Mihailescu[c], Ion N. Mihailescu[c], Cristina Besleaga[d], Lars Österlund[e], Kostadinka A. Gesheva[g]*
[a] "Georgi Nadjakov" Institute of Solid State Physics, Bulgarian Academy of Sciences, 72 Tzarigradsko chaussee Blvd., 1784 Sofia, Bulgaria. [b] MTA-BME Technical Analytical Chemistry Research Group, Szent Gellért tér 4., H-1111, Budapest, Hungary. [c] National Institute for Lasers, Plasma and Radiation Physics, 409 Atomistilor Street, RO-77125, Magurele-Ilfov, Romania. [d] National Institute of Materials Physics, 405A Atomistilor Street, Magurele-Ilfov, RO-077125, Romania .[e] Ångström Laboratory, Uppsala University, Lägerhyddsv. 1, Box 534, 751 21 Uppsala, Sweden. [f] Budapest University of Technology and Economics, Department of Inorganic and Analytical Chemistry, 4 Műegyetem rakpart, H-1111, Budapest, Hungary. [g] Central Laboratory of Solar Energy and New Energy Sources, Bulgarian Academy of Sciences, 72 Tzarigradsko chaussee Blvd., 1784 Sofia, Bulgaria.

10:25 BREAK

I-11 – FUNCTIONAL METAL OXIDE INTERFACES IN EFFICIENT ELECTROCHEMICAL ENERGY CONVERSION, BIOMASS CONVERSION AND CHARGE STORAGE SYSTEMS

B. Fiore di Botta

Room B4

I-11/7

Chairmen: Pawel Kulesza, John Errington

9:00 I-11_30/O
Hybrid Fuel Cells
Ahmet Deniz Benli[a], Yelda Yorulmaz[a], Hazal Batili[a], Gulcan Corapcioglu [b]Shalima Shawuti[a], Meltem Sezen[b], Mehmet Ali Gulgun [a,b]*
[a]Sabanci University, Department of Materials Science and Nano Engineering, FENS, 34956, Turkey. [b] Sabanci University, Department of Materials Science and Nano Engineering, SUNUM, 34956, Turkey.

9:20 I-11_31/O
Effect of H_3BO_3 additives on structure and properties of Al-contained $Li_7La_3Zr_2O_{12}$ solid electrolyte
Chongyang Shao, Zhiyong Yu, Hanxing Liu, Zhenning Zheng, Nian Sun*
State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, 430070, China.

9:40 I-11_32/O
Short stack kit platform for cells and interconnects development
*Pierre Coquoz [a], Noelia Coton [a], Florian Cottier [a], Andre Pappas [a], Hugh Middleton [b], Raphael Ihringer [a]**
[a] Fiaxell Sàrl, EPFL Science Parc, PSE A, 1015 Lausanne, Switzerland [b] Faculty of Engineering Science, University of Agder, 4879 Grimstad, Norway.

10:00 I-11_33/O
Porosity Optimization of Ni-YSZ Cermet for an Intermediate Temperature Solid Oxide Fuel Cell
Dorna Heidari [a]*, Sirus Javadpour [b], Chan Siew Hwa [c]
[a] School of Materials Science and Engineering, Shiraz University, Shiraz, Iran
[b] School of Mechanical and Aerospace Engineering, Nanyang Technological [c] University, Singapore, Singapore.

10:20 I-11_34/O
Mg-Ni and Mg-Cu containing bismuth niobates: synthesis, structure and electrical properties
Maria Koroleva, Irina Piir, Nikolay Sekushin
Institute of Chemistry Komi SC UB RAS, Pervomayskaya St. 48, Syktyvkar, 167982, Russia.

10:40 BREAK

I-17 – MESOSCOPIC SOLAR CELLS

A. Padova Fiere

Room A7

I-17/4

Chairman: Alessio Gagliardi

9:00 I-17_13/I
Copper Complexes for Dye-sensitized Solar Cells
Marina Freitag[a], Yasemin Saygili[b], Yiming Cao[c], Paul Liska[c], Michael Grätzel[c], Anders Hagfeldt[b]
[a] Uppsala University, Ångström Laboratory, 521 20 Uppsala, SE. [b] EPFL, LSPM, 1015 Lausanne, CH. [c] EPFL, LPI, 1015 Lausanne*, Sweden.*

9:25 I-17_14/I
Enhancement of Sn/Pb mixed metal halide perovsikite solar cells from view point of hetero-interfacial trap distribution
Shuzi Hayase
Kyushu National Institute of Technology, 2-4 Hibikino Wakamatsuku Kitakyushu 808-0196, Japan.

9:50 I-17_15/O
A Crystal Engineering Approach for Scalable Perovskite Solar Cells and ModulesFabrication
Narges Yaghoobi Nia, Mahmoud Zendehdel, Fabio Matteocci, Lucio Cina, Aldo Di Carlo*
CHOSE. (Centre for Hybrid and Organic Solar Energy), University of Rome "Tor Vergata", via del Politecnico 1, Rome 00133, Italy.

10:10 I-17_16 /O
High Li-ion Concentration and Diffusion in Methylammonium Lead Bromide Perovskite Battery Anodes
Nuria Vicente and Germà Garcia-Belmonte*
Institute of Advanced Materials (INAM), Universitat Jaume I, 12006 Castelló, Spain.

10:30 BREAK

I-17/5

Chairman: Marina Freitag

11:00 I-17_17 /O
AC Characteristics of Inorganic-Organic Hybrid Perovskites
*Dang Thanh Nguyen[a], Won Seok Woo[b], Chang Won Ahn [b], Hak-Geun Lee[c], Woon-Seok Yang[c], Sang-Il Seok[c], Ill Won Kim[b], Jong-Sook Lee[a]**
[a] Chonnam National University, School of Materials Science and Engineering, Gwangju 61186, Korea. [b] University of Ulsan, Department of Physics and Energy Harvest-Storage Center, Ulsan 44610, Korea. [c] School of Energy and Chemical Engineering, UNIST, Ulsan 44919, Korea.

11:20 I-17_18/O
The Partial Conductivity Measurements on Methylammonium Lead Tribromide Perovskite Materials
*Kai Wang[a], Yuiga Nakamura[b], Takashi Kondo [b], Kiyoshi Kobayashi[c], and Shu Yamaguchi [a]**
[a] The Univ. of Tokyo, Dept. of Mater. Eng., Hongo 7-3-1, Bunkyo-Ku, Tokyo 113-8656, Japan. [b] The Univ. of Tokyo, RCAST, Komaba 4-6-1, Meguro-Ku, Tokyo 153-8904, Japan. [c]National Institute for Mater. Sci., Sengen 1-2-1, Tsukuba 305-0047, Japan.

11:40 BREAK

MACRO AREA 2: IONICS IN COMMUNICATION AND ROBOTICS

II-1 – LOW-DIMENSIONAL IONIC AND MIXED IONIC/ELECTRONIC CONDUCTOR NANOSTRUCTURES

A. Padova Fiere

Room A5

II-1/5

Chairman: Nini Pryds

8:00 II-1_21/I
Interface-dominated MIECs for integration in solid state ionics devices
F. Chiabrera[1(a)], A. M. Saranya[(a)], D. Pla[(a)], A. Morata[(a)], A. Cavallaro[(b)], J. Canales-Vázquez[(c)], L. López-Conesa[(d)], A. Ruiz-Caridad[(d)], S. Estradé[(d)], F. Peiró[(d)], J. A. Kilner[(b, e)], M. Burriel[(a, f)], A. Tarancón[(a)]*
[(a)] IREC – Catalonia Institute for Energy Research, Sant Adrià del Besòs, 08930, Spain. [(b)] Imperial College London– Department of Materials, London, SW7 2AZ, UK. [(c)] UCLM– Instituto de Energías Renovables, 02071 Albacete, Spain. [(d)] UB– LENS-MIND-IN2UB, Department Electrònica, 08028-Barcelona, Spain. [(e)] I2CNER– Hydrogen Production Division, Fukuoka 819-0395, Japan. [(f)] CNRS-Grenoble INP– LMGP, 38016 Grenoble Cedex 1, France.

8:25 II-1_22/I
***In situ* optical studies of point defect chemistry and kinetics in thin film mixed conducting oxides**
Nicola H. Perry[(a, b)], Ting Chen[(b, c)], Nam-Hoon Kim[(d)], Elif Ertekin[(a, d)], George F. Harrington[(a, b, e)], Kazunari Sasaki[(b, c, e)], and Harry L. Tuller[(a, b)]*
[(a)] International Institute for Carbon-Neutral Energy Research (wpi-I²CNER), Kyushu University, 744 Motooka, Nishi-ku Fukuoka 819-0395, Japan. [(b)] Department of Materials Science and Engineering, MIT, 77 Massachusetts Ave., Cambridge MA 02139, USA. [(c)] Department of Hydrogen Energy Systems, Kyushu University, 744 Motooka, Nishi-ku Fukuoka 819-0395, Japan
[(d)] Department of Mechanical Engineering, University of Illinois at Urbana-Champaign, 1206 W Green St, Urbana, IL 61801, USA. [(e)] Next-Generation Fuel Cell Research Center (NEXT-FC), Kyushu University, 744 Motooka, Nishi-ku Fukuoka 819-0325, Japan.

8:50 II-1_23/I
Thin film model electrodes and their relevance for SOFCs
Peter Vang Hendriksen, Christodoulos Chatzichristodoulou, Dordije Tripkovic and Simona Ovtar
DTU-Energy, Technical University of Denmark, Department of Energy Conversion and Storage, Frederiksborgvej 399, DK-4000 Roskilde, Denmark.

9:15 II-1_24/I
High temperature electrical surface characterization by scanning probe microscopy
*Karin Vels Hansen**
Technical University of Denmark, Department of Energy Conversion and Storage, Risø Campus, Frederiksborgvej 399, 4000 Roskilde, Denmark.

9:40 II-1_25/I
Are amorphous metal oxides a viable route towards low temperature SOFC applications?
Andrea Cavallaro, Enrique Ruiz,Stevin Pramana and Stephen Skinner*
Imperial College London, Department of Materials, South Kensington Campus, SW7 2AZ London, UK.

10:05 II-1_26/I
In-Situ Impedance Analysis of Mixed Ionic-Electronic Conducting Thin Films and Substrates during Pulsed Laser Deposition
*Markus Kubicek**
TU Wien, Institute of Chemical Technologies and Analytics, Getreidemarkt 9, 1060 Wien, Austria.

10:30 BREAK

II-1/6

Chairman: Monica Burriel

11:00 II-1_27/I
Ionic conductivity and defect association in strained thin films
George F. Harrington[(a, b, c, d)], Nicola H. Perry[(b, d)], Kazunari Sasaki[(a)], Bilge Yildiz[(c, a)], and Harry L. Tuller[(b, a, d)]
[(a)] Next-Generation Fuel Cell Research Centre, Kyushu University, 744 Motooka, Nishi-ku Fukuoka 819-0395, Japan. [(b)] Department of Materials Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge MA 02139, U.S.A. [(c)] Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge MA 02139, USA. [(d)] International Institute for Carbon-Neutral Energy Research, Kyushu University, 744 Motooka, Nishi-ku Fukuoka 819-0395, Japan.

11:25 II-1_28/I
In Situ Surface Potential Evolution Along Oxide Heterointerfaces
*Stephen S. Nonnenmann**
Mechanical and Industrial Engineering, Materials Science Program, University of Massachusetts-Amherst.

11:50 BREAK

II-3 – THE SCIENCE AND TECHNOLOGY OF 2D MATERIALS

B. Fiore di Botta

Room B2

II-3/6

Chairman: Hua Zhang

8:00 II-3_27/I
Two-Dimensional Materials for In-Plane Micro-Supercapacitors
*Xinliang Feng**
Department, Department of Chemistry and Food Chemistry & Center for Advancing Electronics Dresden (cfaed), Technische Universität Dresden, 01062 Dresden, Germany.

8:25 II-3_28/I
2D materials for Perovskite Solar Cells
*Aldo Di Carlo**
CHOSE-Centre for Hybrid and Organic Solar Energy, University of Rome "Tor Vergata", via del Politecnico 1, 00133 Roma, Italy.

8:50 II-3_29/I
Growth and Potential Applications of Hexagonal Boron Nitride by CVD
Hyeon Suk Shin*
Ulsan National Institute of Science and Technology (UNIST), Department of Chemistry and Department of Energy Engineering, Ulsan 44919, Republic of Korea.

9:15 II-3_30/O
Enhancing the stability of PbS quantum dot solar cells by incorporation of reduced graphene oxide
Beatriz Martín-García,[(a)] Yu Bi,[(b)] Mirko Prato,[(a)] Davide Spirito,[(a)] Roman Krahne,[(a)] Gerasimos Konstantatos[(b)] and Iwan Moreels[(a)]*
[(a)] Istituto Italiano di Tecnologia, Via Morego, 30, 16163 Genova, Italy. [(b)] ICFO-Institut de Ciencies Fotoniques. The Barcelona Institute of Science and Technology, 08860 Castelldefels (Barcelona), Spain.

9:35 II-3_31/O
High efficient scalable graphene doped Electron Transport Layer (ETL) for perovskite photovoltaic devices fabricated through full-automated Spray Coating technique
Babak Taheri, Antonio Agresti, Sara Pescetelli, Narges Yaghoobinia, Lucio Cinà, Fabio Matteocci, Aldo Di Carlo*
University of Rome Torvergata CHOSE - Electrical Engineering Department - Via Politecnico 1, 00133 Roma.

9:55 II-3_32/O
Two-Dimensional MXene for Nonaqueous Hybrid Supercapacitors
Masashi Okubo,[(a),(b)] Satoshi Kajiyama,[(a)] HirokiIInuma,[(a)] Akira Sugahara,[(a)] Lucie Szabova, [(c)] Keitaro Sodeyama,[(b),(c)] Yoshitaka Tateyama,[(b),(c)] Atsuo Yamada[(a),(b),*]
[(a)] The University of Tokyo, Hongo 7-3-1, Bunkyo-ku, Tokyo, Japan. [(b)] Kyoto University, Nishikyo-ku, Kyoto, Japan. [(c)] National Institute of Materials Science, Tsukuba, Ibaraki, Japan.

10:15 II-3_33/O
Laser processing of 2D Nanosheet based Hybrid Materials for Organic Electronics
Emmanuel Stratakis*
Institute of Electronic Structure and Laser, Foundation for Research & Technology Hellas, (IESL-FORTH), P. O. Box 1527, Heraklion 711 10, Greece.

10:35 BREAK

MACRO AREA 3: IONICS IN BIOLOGICAL SYSTEMS AND LIFE SCIENCES

III-1– IONICS MEETS BIOSCIENCE

B. Fiore di Botta

Room B8

III-1/4

Chairman: Nicola Cioffi

8:35 III-1_14/I
Managing the healing response around flexible brain implants by conducting polymer based functionalization with on-demand release
Christian Boehler[(a)], Thomas Stieglitz[(a)], Ulrich G Hofmann[(b)] and Maria Asplund[(a)*]
[(a)] University of Freiburg, BrainLinks-BrainTools & IMTEK, Georges-Koehler Allee 102, 79110 Freiburg, Germany. [(b)] Medical Center - University Freiburg, Section for Neuroelectronic Systems, Freiburg, Germany.

9:00 III-1_15/I
Patterned systems for cell monitoring and guiding
Marianna Barbalinardo[1], Denis Gentili[1], Francesco Valle[1], Marco Brucale[1], Manuela Melucci[2] and Massimiliano Cavallini[1]*
[(1)] Istituto per lo Studio dei Materiali Nanostrutturati, CNR. Via P. Gobetti 101 Bologna, IT. [(2)] Istituto per la sintesi Organica e la Fotoreattività, CNR. Via P. Gobetti 101 Bologna, IT.

9:25 III-1_16/I
Electrochemical scanning probe techniques for the characterization of nanomaterials
Peter Knittel, Christine Kranz*
Ulm University, Institute of Analytical and Bioanalytical Chemistry, Albert-Einstein-Allee 11, 89081 Ulm, Germany.

9:50 III-1_17/I
Spin-dependent Transport through Chiral Molecules Studied by Spin-dependent Electrochemistry
Claudio Fontanesi
Department of Engineering, Univ. of Modena and R. Emilia, Via Vivarelli 10, 41125 Modena, Italy.

10:15 III-1_18/I
Characterization of modified surfaces combining Electrochemical and Microscopic techniques with synchrotron radiation methodologies
Massimo Innocenti[(a)(c)*], Francesco Di Benedetto[(b)], Alessandro Lavacchi[(c)], Maurizio Passaponti[(a)], Emanuele Salvietti[(a)], Andrea Giaccherini[(a)], Enrico Berretti[(a)], Walter Giurlani[(a)], Antonio De Luca[(a)], Francesco Carlà[(d)], and Roberto Felici[(e)].
(a) University of Florence, Department of Chemistry, Via della Lastruccia 3, Sesto Fiorentino (FI) Italy. (b) University of Florence, Department of Earth Science, Via la Pira 4, 50121 Firenze, Italy. (c) Institute of Chemistry of Organo-Metallic Compounds, ICCOM-CNR and INSTM Consortium, 50019 Sesto F. no, (FI), Italy. (d) ESRF – The European Synchrotron – BP220, F-38043, Grenoble (France). (e) SPIN-CNR, Rome, Italy.

10:40 BREAK

MACRO AREA 4: GENERAL ASPECTS, FUNDAMENTALS AND THEORY IN ION-CONDUCTING MATERIALS

IV-4 - POINT DEFECT CHEMISTRY OF OXIDE MATERIALS

A. Padova Fiere

Room A3

IV-4/8

Chairmen: Rotraut Merkle, Francesco Ciucci

8:30 IV-4_28/I
On Point Defects and Structural Symmetry Breaks under High Electric Fields
Jennifer L. M. Rupp[(a)*], Felix Messerschmitt[(a,b)], Andreas Nenning[(a,b)], Sebastian Schweiger[(b)], Rafael Schmitt[(b)], Reto Pfenninger[(a,b)], Roman Korobko[(b)], Eva Sediva[(a,b)], William Bowman[(a)]
(a) Massachusetts Institute of Technology, Department of Materials Science and Engineering, Cambridge, USA. (b) ETH Zürich, Department of Materials, Zürich, Switzerland.

8:55 IV-4_29/I
Point defects and anelasticity in pure and Gd-doped ceria
Olga Kraynis[a], Ellen Wachtel[b], Anatoly Frenkel[b], Igor Lubomirsky[a, *]
[(a)] Dept. of Materials and Interfaces, Weizmann Institute of Science, Rehovot, Israel. [(b)] Dept. of Materials Science and Chemical Engineering, Stony Brook University, NY.

9:20 IV-4_30/O
The effect of grain boundary orientation on space charge profiles in Gd-doped CeO_2
Georgie Wellock[(a)*], Joel Statham[(a)], Marco Molinari[(b)], Steve Parker[(a)], Benjamin Morgan[(a)]
(a) University of Bath, Department of Chemistry, Claverton Down, Bath, BA2 7AY, United Kingdom. (b) University of Huddersfield, Department of Chemical & Biological Sciences, Queensgate, Huddersfield, HD1 3DH, United Kingdom.

9:40 IV-4_31/O
Micoelectrode-EIS for the investigation of Oxygen exchange on Ceria-Gadolinia at the electrode-electrolyte interface
Jonas J. Neumeier [(a)*], Matthias T. Elm[(a)(b)], Bjoern Luerßen[(a)], Jürgen Janek[(a)]
[(a)]Justus-Liebig-Universität Gießen, Physikalisch-Chemisches Institut, Heinrich-Buff-Ring 17, 35392 Gießen, Germany. [(b)] Justus-Liebig-Universität Gießen, I. Physikalisches Institut, Heinrich-Buff-Ring 16, 35392 Gießen, Germany.

10:00 IV-4_32/O
Transport properties and non-stoichiometry of ceria single crystals substituted with praseodymia
Kathrin Michel[(a)*], Jens-Peter Eufinger[(a, b)], Gregor Ulbrich[(c)], Martin Lerch[(c)], Jürgen Janek[(a)], Matthias T. Elm[(a, d)]
[(a)] Institute of Physical Chemistry, Justus Liebig University Giessen, Heinrich-Buff-Ring 17, 35392 Giessen, Germany. [(b)] NGK Europe GmbH, Westerbachstrasse 32, 61476 Kronberg im Taunus, Germany. [(c)] Institute of Chemistry, Technical University Berlin, Strasse des 17. Juni 135, 10623 Berlin, Germany. [(d)] Institute of Experimental Physics I, Justus Liebig University, Heinrich-Buff-Ring 16, 35392 Giessen, Germany.

10:20 IV-4_33/O
Surface Defect Chemistry and Electronic Structure of $Pr_{0.1}Ce_{0.9}O_{2-\delta}$ Revealed *in operando*
Qiyang Lu[(a)], Gulin Vardar[(b)], Maximillian Jansen[(b)], Sean Bishop[(a)], Iradwikanari Waluyo[(c)], Harry Tuller[(a)] and Bilge Yildiz[(b)*]
[(a)] Massachusetts Institute of Technology, Department of Materials Science and Engineering, 77 Massachusetts Avenue, Cambridge MA 02139, USA. [(b)] Massachusetts Institute of Technology, Department of Nuclear Science and Engineering, 77 Massachusetts Avenue, Cambridge

MA 02139, USA. [c] Brookhaven National Laboratory, National Synchrotron Light SourceII, Upton NY 11973, USA.

10:40 BREAK

IV-4/9

Chairman: Yoed Tsur

11:00 IV-4_34/O
Electrical conductivities and Fermi level positions of ceria thin films: Comparisons between experiment and theory
Hans F. Wardenga[a], Stephan P. Waldow[b], Roger A.de Souza[b], Andreas Klein[a]*
[a] Technische Universität Darmstadt, Institute of Materials Science, Jovanka-Bontschits-Str. 2, 64287 Darmstadt, Germany. [b] RWTH Aachen University, Institute of Physical Chemistry, Landoltweg 2, 52056 Aachen, Germany.

11:20 IV-4_35/O
Fermi level position in Gd doped ceria thin films
Hans F. Wardenga, Katharina Schuldt, Andreas Klein*
Technische Universität Darmstadt, Institute of Materials Science, Jovanka-Bontschits-Str. 2, 64287 Darmstadt, Germany.

11:40 BREAK

IV-7 – NUCLEAR MAGNETIC RESONANCE IN SOLID STATE IONICS

A. Padova Fiere

Room A4

IV-7/2

Chairman: M. Gobet

8:00 IV-7_6/I
Long-range Lithium Ion Diffusion for Nasicon-type $Li_{1.5}Al_{0.5}Ge_{1.5}(PO_4)_3$ (LAGP) studied by ^{7}Li Pulsed-Gradient Spin-Echo NMR Spectroscopy
Kikuko Hayamizu[a], Shiro Seki[b]
(a) Institute of Applied Physics, University of Tsukuba, Tennodai, Tsukuba 305-8573, Japan. (b) Material Science Laboratory, Central Research Institute of Electric Power Industry, Nagasaka, Yokosuka 240-0196, Japan.

8:25 IV-7_7/I
Quantifying Contributions to Transport from Molecular to Micron Scales in Ion-Dense Electrolytes
Louis A. Madsen
Virginia Tech, Department of Chemistry and Macromolecules Innovation Institute, Blacksburg, VA 24061, USA.

8:50 IV-7_8/I
Diffusion and electrophoretic NMR to characterize ion transport and transference numbers in electrolytes
*Florian Schmidt, Martin Gouverneur, Marc Brinkkötter, Monika Schönhoff**
Institute of Physical Chemistry, University of Muenster, Corrensstraße 28/30, D-48149 Münster, Germany.

9:15 IV-7_9/I
NMR Characterization of Ion Transport in Materials
Sophia Suarez[a], Kartik Pilar[a], Steve Greenbaum[b], James Wishart[c] and Stefano Passerini[d]
[a] Brooklyn College of CUNY, Brooklyn, NY, 11210 USA. [b] Hunter College of CUNY, New York, NY 10065 USA. [c] Chemistry Division, Brookhaven National Laboratory, Upton, NY 11973 USA. [d] Helmholtz Institute Ulm, Germany.

9:40 IV-7_10/I
Diffusion in materials, from high temperature to complex materials
M. Deschamps, T. V. Huynh, R. J. Messinger, M. Gobet, V. Sarou-Kanian, C. Bessada
CEMHTI CNRS UPR3079, Orléans University, 1D avenue de la recherche scientifique, 45071 Orléans Cedex 2, France.

10:05 IV-7_11/I
Insights into atomic-level structure of materials from Dynamic Nuclear Polarization-enhanced NMR spectroscopy
Hiroki Nagashima, Frédérique Pourpoint, Julien Trébosc, Jean-Paul Amoureux, Olivier Lafon
Univ. Lille, CNRS, ENSCL, UMR 8181, UCCS, Lille, France.

10:30 IV-7_12/O
Understanding local structure and oxide-ion dynamics in functional paramagnetic oxides using ^{17}O solid-state NMR
David M. Halat , Matthew T. Dunstan, Rachel N. Kerber, Michael W. Gaultois and Clare P. Grey
University of Cambridge, Department of Chemistry, Lensfield Road, Cambridge CB2 1EW, UK.

10:50 BREAK

PLENARY

A. Padova Fiere

Room A1

Chairman: Vito Di Noto

12:00 P5 – Michael Grätzel
The Amazing Rise of Pervoskite Solar Cells
Michael Grätzel
École polytechnique fédérale de Lausanne, Switzerland.

CLOSING CEREMONY

A. Padova Fiere

Room A1

12:45 CLOSING CEREMONY & REMARKS

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